Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources
GEOLOGICAL SURVEY BRANCH

BRITISH COLUMBIA MINERAL EXPLORATION REVIEW 1988

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EXPLORATION AND DEVELOPMENT HIGHLIGHTS BRITISH COLUMBIA, 1988

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INTRODUCTION

Mineral exploration continued at a very strong pace in 1988, with the main focus remaining on gold and silver. An all-time record of $192 million in mineral exploration expenditures was registered in 1987, and 1988 is expected to reach $150 million. The number of claims staked in 1988 was 73 870, down by 24 387 from the 98 257 claims recorded in 1987. This represents a 25 per cent decrease in staking activity from the previous year, a reasonable figure assuming many companies have commenced advanced exploration programs after completing a ground acquisition phase in the earlier stages of the precious metals boom.

EXPLORATION EXPENDITURES AND
NUMBER OF MINERAL CLAIMS RECORDED
1974-1988

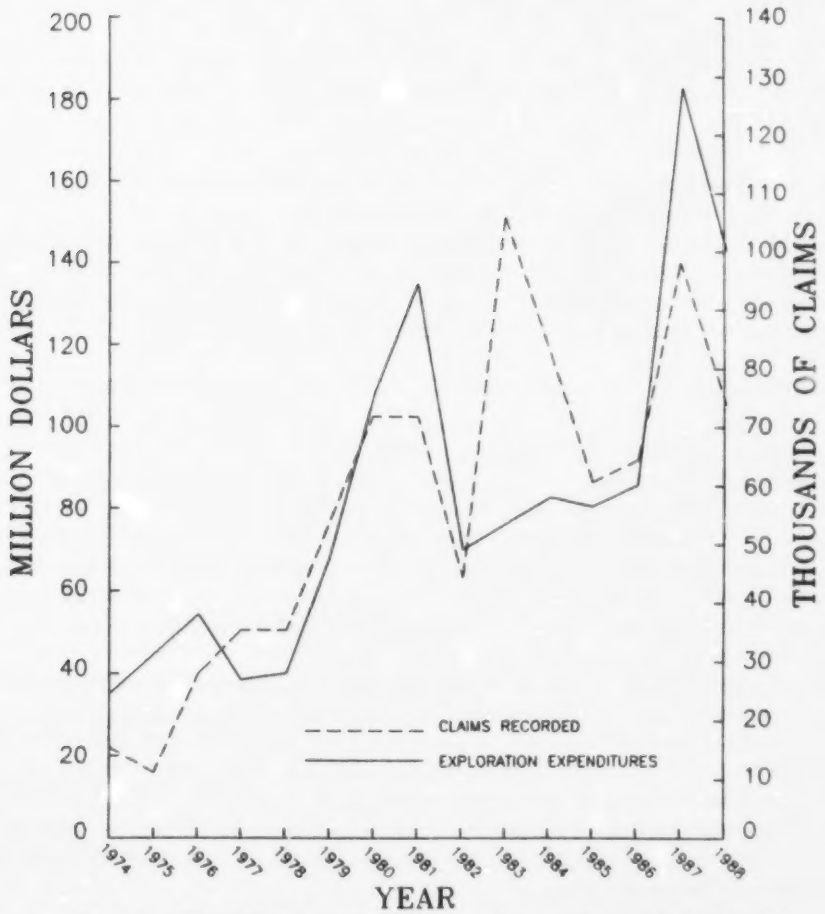

Figure A1 Mineral exploration expenditures and number of claims recorded, 1974-1988

Capital investment in new mines, that have either opened in 1988 or are expected to open in 1989, is in excess of $315 million and represents the creation of 1100 new jobs required for the operation of these projects.

Total value of mineral production for 1987 is estimated at $3.4 billion, up marginally from $3.2 billion in 1986. Coal and copper continued to register the highest total values at about $855 million each. In 1987 gold was firmly in second place in the metal sector with the production of 369 775 ounces, or 11.48 tonnes valued at $227 million. Gold production figures for the first half of 1988 are up 38 per cent from the same period in 1987. If this trend continues, 1988 gold production, approach 515 000 ounces, or 16 tonnes, more than double the 217 863 ounces, or 6.776 tonnes, produced in 1985.

The vigorous exploration pace of the past three years has resulted in an unprecedented level of development and a record number of submissions to the provincial Mine Development Review Process for new mine development approval. A total of 40 projects are currently in the review process, 32 of which are for precious metals.

Two new gold operations opened in 1988, the Skyline Explorations Ltd. Johnny Mountain mine, located in the rugged northwestern part of the province, 95 kilometres northwest of Stewart, and Candorado Mines Ltd. tailings-leach operation at Hedley. In the same geologic environment as Skyline, two other gold mines are being readied for production in 1989: the nearby Snip deposit of Delaware Resources Corporation and Cominco Ltd., and, near Stewart, the Silbak Premier-Big Missouri project of Westmin Resources Limited, Silbak Premier Mines Ltd. and Canacord Resources Inc.

Elsewhere, new mines under construction include Lawyers of Cheni Gold Mines Inc., Golden Bear of North American Metals B.C. Corporation, Samatosum of Minnova Inc., Esperanza of Esperanza Explorations Ltd., Spud of McAdam Resources Inc. and Gold Wedge of Catear Resources Inc., all precious metal projects, and the McDame asbestos project of Cassiar Mining Corporation.

Most exploration and development projects were for precious metals and were located in the rugged northwestern part of the province where the Iskut gold camp, site of the Johnny Mountain and Snip deposits, has attained a very significant status with greater than 1.75 million ounces, or nearly 55 tonnes, of gold identified in these two deposits alone.

EXPLORATION HIGHLIGHTS

Precious metals are being sought and found in the five main geological settings briefly summarized below:

TRANSITIONAL DEPOSITS

These deposits formed in a transitional setting between the classic epithermal and the deeper-seated porphyry environments. They include most of the important deposits of the Stewart and Iskut camps, specifically Silbak Premier - Big Missouri of Westmin Resources, the Sulphurets property of Newhawk Gold Mines Ltd., the Johnny Mountain Mine of Skyline Explorations, and the nearby Snip deposit of Delaware Resources and Cominco Ltd. Johnny Mountain is British Columbia's newest gold mine and the other deposits are under development or at an advanced stage of exploration.

PORPHYRY DEPOSITS

Alkalic or syenitic porphyry copper systems in British Columbia have long been known to contain significant amounts of gold; gold is an important byproduct at the Afton and Similkameen mines. Some subeconomic copper deposits located during porphyry exploration in the 1960s are being explored again to determine whether they contain gold-enriched zones which may be selectively mined. Examples from central British Columbia are the Q.R. deposit held by Q.P.X. Minerals Inc. and the nearby Cariboo Bell deposit of Imperial Metals Corporation, where definition drilling is underway. Targets at Cariboo Bell are pittable zones of 2.5 to 4.5 million tonnes grading at least 6.8 grams per tonne gold. The outlook for this property is very good. Previously estimated porphyry copper reserves were 116 million tonnes grading 0.31 per cent copper and 0.41 grams per tonne gold.

Other interesting projects of this type, all in the Omineca region northwest of Prince George, are the Phil-Heidi (Mount Milligan) deposit of Lincoln Resources Inc., the Tas property of Noranda Exploration Company, Limited, the Indata property of Eastfield Resources Ltd., and the Talka-Rainbow property of Cathedral Gold Corporation. All of these properties have good potential for large low-grade deposits grading 0.5 per cent or less copper and 1 gram per tonne or less gold and smaller, higher grade shear-controlled targets.

Near Slocan, in the south-central part of the province, gold-copper mineralization at the Willa deposit of Northair Mines Limited occurs in silicified porphyries, intrusive breccia and strongly propylitized coeval volcanics of the Lower Jurassic Rossland Group.

EPITHERMAL DEPOSITS

Classic epithermal systems in Mesozoic and Tertiary volcanic rocks are the host environment for at least one of the province's developing gold mines. The Lawyers deposit of Cheni Gold Mines Inc. is located in the Toodoggone area, 300 kilometres north of Smithers, and is expected to begin production before the end of the year.

Other deposits of this type, that have reached the advanced exploration stage, include the Al deposit of Energex Minerals Ltd., also in the Toodoggone area, and the Cinola deposit of City Resources (Canada) Ltd., on the Queen Charlotte Islands. Exciting new discoveries in Eocene volcanic rocks in the easily accessible Okanagan region include the Brett deposit of Huntington Resources Inc. and the Vault deposit of Canadian Nickel Company Ltd.

VOLCANOGENIC MASSIVE SULPHIDES

Since the discovery by Westmin Resources of the world class HW massive sulphide deposit on Vancouver Island in 1979, Paleozoic and Mesozoic submarine volcanic sequences in British Columbia have been intensively explored for similar deposits. The silver-rich Samatosum deposit of Minnova Inc. was discovered late in 1985 and is scheduled to begin production early in 1989. Other massive sulphide deposits under active exploration include the Lara deposit of Laramide Resources Limited on Vancouver Island and, in the northwestern part of the province, the Windy Craggy deposit of Geddes Resources Ltd. and the Tulsequah Chief deposit of Redfern Resources Ltd. and Cominco Ltd.

GOLD-ENRICHED SKARNS

The re-opening of the Nickel Plate mine of Corona Corporation in 1987 as an open pit-operation, brought into focus the importance of this deposit type in British Columbia. The province has more than 300 recorded skarn occurrences, roughly one third of which contain gold. The Tillicum Mountain deposit of Esperanza Explorations Ltd., in the Kootenay region, has been actively explored by Esperanza since 1980, with total expenditures amounting to approximately $8 million.

Other potentially economic gold-enriched skarns include deposits at Zeballos on Vancouver Island, on Banks Island, on Texada Island and in the Rossland volcanic rocks near Nelson, for example, the Second Relief, a past producer which has yielded nearly 3.1 tonnes of gold.

OTHER SIGNIFICANT DEPOSITS

A number of other precious metal deposits, mostly associated with major faults, are definitely highlights on the British Columbia scene.

The Golden Bear deposit of North American Metals Inc., located west of Dease Lake, is under development. Gold occurs in silicified and breccia zones along a major fault between Permian limestones and upper Triassic andesites.

The mesothermal veins of the Bridge River gold camp, historically the Province's largest gold producer, are associated with major fault structures. The Bralorne mine of Corona Corporation and the nearby Congress deposit of Congress Operating Corporation are the targets of major exploration programs.

On Vancouver Island, Westmin Resources continued with a major exploration program on its Debbie property southeast of Port Alberni. Gold mineralization occurs in veins and extensive quartz-carbonate-pyrite alteration zones associated with north-trending faults, as well as in a magnetite-jasper-sulphide-bearing chert with quartz-vein stockwork in the footwall basalt.

The Harrison Lake gold deposit of Bema International Resources Inc., located near Vancouver, occurs in a quartz-vein stockwork in a Tertiary quartz diorite and continues to be aggressively explored.

A major shift in production is underway at the Cassiar asbestos mine. Reserves in the open pit are nearing exhaustion and the large McDame underground orebody is being developed to ensure continued production at least to the year 2000.

Although in 1987 coal ranked with copper as the province's highest value mineral product at $855 million, overall production value dropped by $75 million or 8 per cent from the previous year, while output rose by 1.3 million tonnes. Difficult and depressed coal markets continue to delay a production decision at the large Mount Klappan anthracite project of Gulf Canada Resources Limited and are dominating critical contract price negotiations for the huge Quintette project of Quintette Coal Ltd.

GOVERNMENT SERVICES AND INCENTIVES

The provincial government has been responsive to the needs of industry in this period of strong exploration activity. Essential geoscientific data is being provided at an unprecedented rate by the British Columbia Geological Survey Branch thanks to a significantly expanded operational budget and the 5 year, Canada/British Columbia Mineral Development Agreement. Significant incentives and legislative changes have also been introduced to better serve industry. Highlights of these programs and incentives are:

* A record level of field programs by the Geological Survey Branch, including ten 1:50 000 regional mapping projects in poorly known or under-explored areas, expanded mineral deposit mapping, Regional Geochemical Surveys, industrial minerals studies and land use studies.
* A FAME-funded $0.5 million Prospectors Assistance and Training program.
* Introduction of the new Mineral Tenure Act which combines and replaces the Mineral and Mining (Placer) Acts, streamlines the mineral tenure system, and allows for the staking of placer claims in a way similar to mineral claims.

AN OUTLOOK FOR THE FUTURE

One of the biggest challenges facing the Canadian mining industry today is to replace depleting reserves of base metals, specifically copper, zinc and lead. Since 1982, Canadian copper reserves have declined 27 per cent, zinc 24 per cent, lead 29 per cent, while gold reserves have increased 94 per cent. The situation in British Columbia is similar. Production of copper, our most valuable metal product, is expected to decline to well below half of the current annual output of 348 000 tonnes by 1998 when six or seven major mines will have closed. Zinc, once ranked second in terms of value of production, is now in fourth place, and output will decline again drastically when the 80-year-old Sullivan mine closes in the next decade. Lead is even farther behind, and will follow the same trend.

The success of gold exploration over the past few years demonstrates that British Columbia is under-explored. Our province is well endowed with copper, zinc and lead, as our past and present production clearly shows. Many known porphyry copper and massive sulphide bodies such as Windy Craggy represent significant undeveloped copper reserves. Others can undoubtedly be found in similar environments. Significant deposits of zinc and lead, such as the Cirque with drill-indicated reserves of 40 million tonnes grading 7.8 per cent zinc and 2.2 per cent lead, are known and await development.

The bottom line is that British Columbia offers an attractive investment climate with exploration targets for base metals which are currently in short supply. As the search for base metals resumes world wide, undoubtedly increased interest will also be paid to British Columbia. Likely targets will be volcanogenic massive sulphides, base metal and precious metal skarns, sedex deposits and gold-copper porphyries. In the meantime, most exploration budgets will remain geared to gold.

1989 should see the opening of at least seven new precious metal mines, namely Lawyers, Esperanza, Snip, Spud, Golden Bear, Samatosum and Silbak Premier - Big-Missouri, representing a total capital investment of $220 million and the creation of about 740 new jobs. More will follow in 1990. The replacement of the Mining Exploration Depletion Allowance scheme (MEDA) in early 1989 by the new Canadian Exploration Incentive Program (CEIP) is expected to reduce exploration expenditures in British Columbia only marginally.

ACKNOWLEDGMENTS

The articles which follow provide more detail of the mineral exploration activity in each of the five District Geologist's areas, the FAME program and the British Columbia Geological Survey's programs. Information on mineral exploration was supplied to the District Geologists, either directly or through press releases, by the many exploration companies active throughout the province. Mineral claims and exploration expenditure statistics were supplied by the Ministry's Mineral Titles Branch and by the British Columbia and Yukon Chamber of Mines.

MINE DEVELOPMENT REVIEW PROCESS (MDRP)
PROJECTS IN REVIEW, DECEMBER, 1988

PROSPECTUS

PROJECT/COMPANY DEVELOPMENT REGION	COMMODITY/PRODUCTION RATE/MINE LIFE	EMPLOYMENT (CONSTRUCTION/ OPERATION)/COMMUNITY	DEVELOPMENT SCHEDULE (STAGE/AIP/PRODUCTION)
Catear (Goldwedge)/ Catear Resources Ltd. North Coast	Au/Ag 181 mtpd for 6-10 yrs	Constr: 50 Op: 30 Campsite/Stewart	Prospectus - Nov 1988 Stage I - Spring 1989 Prod. - Mid 1989
Equinox (J+L)/ Equinox Resources Ltd./ Pan American Minerals Corp. Kootenay	Au/Ag/Pb/Zn 350 mtpd for 10 yrs +	Constr: 50 man yrs Op: 80 - 90 Revelstoke	Prospectus - Dec 1988 Stage I - Sept 1989 Prod. - Sept 1991
Laredo Limestone Quarry/Laredo North Coast	$CaCO_3$ (Limestone) 8000 mtpd for 30 yrs	Constr: 12 man yrs Op: 50	Prospectus - Dec 1988 Stage I - Need Undetermined Prod. - Late 1989
Oliver/Valhalla Gold Group Corp. Thompson-Okanagan	Au 300 tpd for 10 yrs	Total - 44 Oliver, Osoyoos Keremeos, Cawston Penticton	Prospectus - Aug. 1988 Stage I - Early 1989 AIP - Spring 1989 Prod. - April 1990
Quesnel River/QPX Minerals Inc./Placer Dome Inc. Cariboo	Au 500 mtpd for 7 yrs.	Constr: 60 Op: 70 Quesnel	Prospectus - July 1988 Stage I - Spring 1989 AIP - Summer 1989 Constr.- Summer 1989 Prod. - Jan 1990

IN STAGE I (OR EQUIVALENT)

PROJECT/COMPANY DEVELOPMENT REGION	COMMODITY/PRODUCTION RATE/MINE LIFE	EMPLOYMENT (CONSTRUCTION/ OPERATION)/COMMUNITY	DEVELOPMENT SCHEDULE (STAGE/AIP/PRODUCTION)
Afton (Ajax Pit)/ Afton Operating Corp. (Teck) Thompson-Okanagan	Cu/Au 27,000 stpd @ 0.46% Cu/0.01 oz/t Au for 7 years	Existing Afton mining and milling workforce Kamloops	Stage I - May 1988 AIP - Jan 1989 Prod. - Spring 1989
Al/Energex Minerals Ltd. Nechako	Au 200 mtpd for 3.2 yrs	Constr: 60 (+12 Road ext.) Op: 65 Smithers, Telkwa, Houston	Stage I - Dec 1987 AIP - Early 1989 Prod. - Uncertain
Bralorne/ Corona Corp. Mainland-S.W.	Au 300 stpd for 4 yrs (est.)	Employment not given in prospectus Bralorne/ Goldbridge/Lillooet	Stage 1 Update - Early 1989 AIP - Uncertain
Congress/Levon Resources Ltd. Mainland-S.W.	Au/Ag 250 stpd for 7 yrs	Op: 97 Bralorne/Goldbridge	Stage I - Sept. 1988 AIP - Spring 1989 Prod. - 1989
Esperanza/Esperanza Explorations Ltd. Kootenay	Au 100 stpd for 5 yrs	Constr. - 5 man yrs Total Op: 30	Stage I - Spring 1989 AIP - Uncertain Prod. - 1990
Fording South Spoil Pile (Eagle Mtn.)/ Fording Coal Ltd. Kootenay	Metallurgical and thermal coal/ Existing production	Existing employment/ Elkford	AIP - Spring 1989 Operation - 1990
Lara/Abermin Corp. Island-Coast	Au/Zn/Cu/ 680 mtpd/ for ? yrs	Op: 75 - 85 Ladysmith, Duncan Dist. of N. Cowichan	Stage I - Uncertain
Line Creek Rock Drain/Crows Nest Resources Ltd. Kootenay	Metallurgical and thermal coal/ Existing production	Existing employment Sparwood/Elkford	AIP - Early 1989 Operation - 1989
Lumby/Quinto Mining Corp. Thompson-Okanagan	Au/Ag/250 stpd for 7 yrs	Op: 58 Lumby	Stage I - Uncertain
Macktush Creek (High Sierra)/ SYMC Resources Ltd. Island-Coast	Au/Ag/Cu 100 stpd for 5 years	Constr: 30 Op: 22 Port Alberni	Stage I - Spring 1989 AIP - Uncertain Prod. - Uncertain
Mascot Tailings/ Sumac Ventures Inc. Thompson-Okanagan	Reprocessing of 685,000 tons of Hedley Mascot Gold tailings @ 700 stpd, 0.058 - .062 0z/t., 5 seasons	16 for 7-9 mos/yr	No development schedule presented in prospectus Stage I Imminent
O'Connor River	Gypsum/2000 tpd	Op: 19	Stage I - Uncertain
Haines Gypsum Inc. Nechako	(300,000 tpy) for 38 years	Haines, Alaska	
Prosper/Tamara Resources Inc. Island-Coast	Au/2500-tonne bulk sample for 3 months	Op: 13 Tofino	Stage I - Uncertain
Sherwood/Casamiro Resource Corp. Island-Coast	Au/Ag/45 stpd/ for 3 yrs min	30 total Port Alberni	AIP - Uncertain Prod. - Uncertain In Strathcona Park Property may be bought back by Province.
Silver Queen/Houston Metals Corp. Nechako	Au/Ag/300 stpd for 10 yrs	Constr: 30 Op: 65 Houston, Smithers, Telkwa	Stage I - Uncertain
Snip/Cominco Ltd./ Delaware Resource Corp. North Coast	Au/Ag 500 stpd for 7 yrs min.	Constr: 145 Op: 125 Smithers, Vancouver	Stage I Sept 1988 AIP - Spring 1989 Prod. - Late 1989

Spud/McAdam Resources Inc. Island-Coast	Au 90 - 185 mtpd for 3 - 4 years	Constr: 15 - 20 Op: 20 - 25 Zeballos	Pilot plant - Fall 1988 Stage I/AIP - Uncertain Full Prod. - 1989
Sulphurets/Newhawk Gold Mines Ltd. North Coast	Au/Ag/450 mtpd for 7 yrs	Op: 50 - 60 Stewart, Smithers, Terrace	Stage I - Spring 1989
Surf Inlet/Surf Inlet Mines Ltd. North Coast	Au/Ag/Cu/300 mtpd for 3 yrs min (up to 10 yrs)	Op: 70-80 Prince Rupert	Stage I - Uncertain
Villalta/Canamin Resources Ltd. Island-Coast	Au/100 mtpd (30,000 mtpy) for 7 yrs	Op: 6 Nanaimo	Stage I - Uncertain
Wilia/Northair Mines Ltd. Kootenay	Au/Cu/360 - 540 mtpd (Up to 160,000 mtpy) for 3.5 yrs min	Op: 50 - 60 Silverton, Slocan City New Denver	Stage I - Mar 1988 AIP - Uncertain Prod. - Uncertain
Windflower/Granges Exploration Ltd./ Windflower Mining Ltd. Thompson-Okanagan	Au 2[illegible] - 300 mtpd for 2 - 3 [illegible]s.	Constr: 20 Op: 35 - 40 Area communities	Pilot Plant - Fall 1988 Stage I/AIP - Uncertain Full Prod. - Uncertain
Windy Craggy/ Geddes Resources Ltd. Nechako	Cu/Co/Au/Ag/Zn 1000 mtpd 20 years	Constr: 150 Op: 200 Whitehorse	Access Assessment - In progress Stage I - 1989 AIP - Uncertain Prod. - 1991
Wingdam "In situ" Leach/ Gold Ridge Resources Inc. Cariboo	Au/recover 13,000 oz/yr for 4 yrs	Total: 16 Quesnel, Barkerville	Stage I - Uncertain
Yellow Giant/TRM Engineering Ltd. North Coast	Au/Ag/200 mtpd for 3 yrs	Op: 80 Prince Rupert	Stage I - Uncertain

STAGES II/III

PROJECT/COMPANY DEVELOPMENT REGION	COMMODITY/PRODUCTION RATE/MINE LIFE	EMPLOYMENT (CONSTRUCTION/ OPERATION)/COMMUNITY	DEVELOPMENT SCHEDULE (STAGE/AIP/PRODUCTION)
Bearcub/Brenda Business Development Thompson-Okanagan	Feldspar, Quartz, Mica 100,000 - 200,000 tpy for 100 yrs	Op: 25 Constr: 40 Lumby	Under Review Prod. - 1989
Cassiar (McDame Extension)/Cassiar Mining Corp. Nechako	Chrysotile Asbestos 1.6 mmtpy-ore 90,000 mtpy - fibre 10 years	Mine: Existing Workforce of 60, to 1990; 150 during 1990; 145 1992 onwards Mill: Existing workforce of 340 Cassiar	AIP - Granted July 1988 Constr:-1988 Prod. - 1990
Cinola/City Resources Canada Ltd. North Coast	Au/Ag/3500-6000 mtpd (1.2-2.1 mmtpy) for 9-15 yrs	Constr: 225 Op: 190 Skidegate, Masset, Port Clements	Stage II - June 1988 AIP - Spring 1989 Production - 1990
Dome Mountain/Teeshin Resources Ltd. Nechako	Au/Ag 310 mtpd (Mill) for 2.6 yrs	Constr: 50 Op: 76 Smithers, Telkwa, Houston	Stage I - Mar 1988 AIP - Sept 1988 Prod. - 1989
Golden Bear/Golden Bear Operating Company (Chevron/Homestake) Nechako	Au/Ag/360 mtpd for 5.5 yrs min.	Constr: 80 (+ 50 for road) Op: 101 Telegraph Cr., Dease Lake, Iskut	Stage I - August 1987 AIP Mine - Oct 1987 Stage II Road - Jan 1988 AIP Road - Mar 1988 Stage II Mine - Early 1989 Prod. - Late 1989
Hedley Tailings Candorado Thompson-Okanagan	Au reworking of 1.7 mmt of tailings @ 4500 mtpd for 2 yrs	22-26 total Hedley, Princeton	Stage 1 - Sept 1987 AIP - Granted Feb 1988 Prod. - Fall 1988
Johnny Mt. (REG)/ Skyline Explorations Ltd. North Coast	Au/Ag/180 mtpd for 5 yrs	Op: 115 Terrace/Vancouver	Stage I - March 1987 AIP - Granted July 1987 Stage II - June 1988 Prod. - Fall 1988
Kutcho Creek/Esso Minerals Canada/Sumac Mines Ltd. Nechako	Cu/Zn/Ag/4000 mtpd (1.4 mmtpy) for 10 yrs min.	Constr: 400 Op: 294 (+ 26 transp. workforce) Dease Lake, Smithers	Stage II - Mar 1986 AIP - decision deferred
Lawyers/Cheni Gold Mines Ltd. Northeast	Au/Ag/500 mtpd (175,000 mtpy) for 5 yrs min.	Constr: 140 Op: 138 Smithers, Telkwa	Stage I - March 1986 AIP - Granted Aug 1986 Prod. - Fall 1988
Mount Klappan/Gulf Canada Resources Ltd. Nechako	Anthracite coal/ 1.5 mmtpy for 20 yrs	Constr: 975 Op: 750 Stewart, Dease Lake Terrace, Smithers	Stage II - Apr 1987 AIP - Uncertain Prod. - Uncertain
Pacific Talc Pacifc Talc Ltd. Mainland-S.W.	Talc 1000 mtpd for 3 yrs min.	± 75 total, including offsite plant Boston Bar	MDRP waived Prod. - Spring 1989
Sage Creek Coal/ Sage Creek Coal Ltd. Kootenay	Thermal coal/ 2.4 mmtpy clean coal for 21 yrs.	400 Fernie	AIP - Granted 1983 Prod. - deferred Under IJC review
Samatosum Minnova Inc. Thompson-Okanagan	Ag/Au 422 stpd for 6 yrs	Constr: 180 Peak Op: 96 Barriere, Kamloops	Stage I - May 1988 AIP - Granted Nov. 1988 Prod. - Mid 1989
Silbak Premier/Big Missouri Westmin Resources Ltd.	Au/Ag/2000 mtpd (730,000 mtpy) for 11 yrs	Op: 157 Stewart	Stage I - March 1987 AIP - Granted July 1987 Stage II - May 1988 Prod. - Spring 1989

(INFORMATION SOURCE: Engineering and Inspection Branch - 12/06/88)

Figure 2. Selected Exploration and Development Projects in British Columbia, 1988.

TABLE 1
NORTHWESTERN DISTRICT

MAP NO.	PROPERTY/MINFILE NAME (OWNER/OPERATOR)	MINFILE NO.	DIVISION	NTS	COMMODITY	DEPOSIT TYPE	WORK DONE
1	Windy Craggy (Geddes Resources)	114P002	Atlin	114P/12E	Cu,Co,Au	Volcanogenic massive sulphide	1474 m undergd drifting; bulk sample; 17 370 m undergrd ddh
2	Squaw Creek (C. Little/ Arbor Resources)		Atlin	114P/04E	Au	Shear	6 ddh, 610 m; geological mapping
3	Mill (United Keno Hill Mines)		Atlin	104M/15	Au		5 ddh, 458 m; geophys.
4	Moon Lake (Noranda Exploration)	104M057	Atlin	104M/15	Au,Zn,Pb	Shear	3 ddh, 500 m; soil and rock geochem; geophys.
5	Pictou (S. Connolly/ Homestake Mineral Development)	104N044	Atlin	104N/12	Au,Ag	Vein	2 ddh, 200 m
6	Heart of Gold (Canova Resources/ Homestake Mineral Development)		Atlin	104N/12	Au	Mesothermal vein	5 ddh, 600 m; airborne & ground geophys; mapping; sampling
7	Yellowjacket (Canova Resources/ Homestake Mineral Development)	104N043	Atlin	104N/12E	Au	Mesothermal vein	23 ddh, 3250 m
8	Pine Creek Placer (Queenstake Resources)	104N030	Atlin	104N/12E	Au	Placer	760 000 m3 gravel moved; 300 000 m 3 sluiced; 25 rcdh
9	Tulsequah (Redfern Resources/ Cominco)	104K002	Atlin	104K/12	Ag,Au,Pb, Zn,Cu	Volcanogenic massive sulphide	13 ddh, 3660 m; 887 m of undergd rehabilitation
10	Polaris Taku (Rembrandt Gold Mines/ Suntac Minerals)	104K003	Atlin	104K/12E	Au,Ag,Cu, Sb	Vein	8 ddh, 1067 m; underground rehabilitation; soil geochem
11	Golden Bear (Chevron Canada Resources/ Golden Bear Operating Company)	104K079	Atlin	104K/01	Au	Replacement	Access road; plant foundations; permanent camp; drilling
12	Bandit-Hijack (Chevron Canada Resources/ Dia Met Minerals)		Atlin	104K/01W	Au		2 ddh, 700 m; bulk sampling
13	Albert Creek (Total Energold)		Liard	104P/16	Ag,Zn,Ba	Fracture, replacement?	3 ddh, 798 m
14	McDame (Cassiar Mining)	104P084	Liard	104P/05E	Asbestos	Ultramafic	1325 m slashing in two adits, 225 m decline, pipeline
15	Hopeful (Sable Resources/ Taurus Resources)	104P010	Liard	104P/5	Au,Ag,Cu, Zn	Mesothermal vein	9 ddh, 740 m; 3600 t bulk sample .
16	Erickson Gold (Total Energold/vein Erickson Gold Mine)	104P029	Liard	104P/04E	Au	Mesothermal	12 196 m surface and 2029 m undergd. ddh, VLF,IP,Mag. trenches
17	Cusac (Total Energold/ Erickson Gold Mine)	104P070	Liard	104P/04E vein	Au	Mesothermal	5 790 m surface & 10 786 m undergd ddh, started adit
18	Castle (Teck Explorations)	104G076	Liard	104G/16	Au,Ag	Pyritic shear?	11 ddh, 1200 m; trenching geochem;
19	Bee Jay (Teck Explorations)		Liard	104G/02	Au,Ag	Vein	9 ddh, 1350 m
20	Trophy Gold (Continental Gold/ United Mineral Services)	104G053	Liard	104G/03	Au,Ag,Zn, Pb,Cu	Breccia, skarn	16 ddh, 2820 m trenching; prospecting; mapping; sampling
21	Barrington River Placer (Integrated resources)	104G008	Liard	104G/12W	Au	Placer	bulk sample; gravity and mag.

22	McLymont Creek (Gulf International Minerals)	104B281	Liard	104B/15	Au,Cu,Ag	Replacement	37 ddh, 4707 m; geological mapping; geochem
23	Ver, Joy (Ticker Tape Resources/ Orequest Consultants)		Liard	104B/15	Ag,Au	Vein	2 ddh, 260 m; rock and soil geochem; mapping
24	Ice, New (Ticker Tape) (Ticker Tape Resources/ Orequest Consultants)		Liard	104B/15	Au,Ag,Pb, Zn	Vein	9 ddh, 976 m; replacement mapping; rock and soil sampling
26	Gab 11,12,Mon1&2,Wei.,Zel,Stu (Consolidated Sea Gold/prospecting; Pamicon Developments Ltd.)		Liard	104B/11E	Au		ddh, 610 m; geochem
25	Gab 7,8,10 (Pezgold/ Pamicon Development Ltd.)		Liard	104B/10	Au		ddh, 824 m; geochem; trenching
27	Brenwest (Brenwest Mining/prospecting; Hi-Tech Resource Management)	104B210	Liard	104B/10	Au,Ag	Shear	4 ddh, 302 m; geochem
28	Gab 9 (Jazzman Resources/ Pamicon Developments Ltd.)		Liard	104B	Au		ddh, 854 m
29	Rob 13 & 14 (Crest Resources, Magenta Development/ Pamicon Developments)	104B005	Liard	104B/10W	Pb,Cu,WL		ddh, 914m
30	Iskut (American Ore,soil & silt Golden Band Resources/ Keewatin Engineering)		Liard	104B/11	Au		10 ddh; geochem; airborne EM, ground VLF & Mag
31	Iskut River (Meridor Resources)	104B076	Liard	104B/11	Au,Cu,Mo	Porphyry?, vein?	63 ddh, 3960 m, soil geochem; geophys.
32	Waratah (Tungco Resources)	104B204	Liard	104B/10W	Au,Ag,Cu	Mesothermal vein	26 ddh, 2513 m; trenching; mag, VLF-EM; soil geochem; mapping
33	Handel,Raven,Chopin (Pamorex Minerals, Winslow Minerals/ Keewatin Engineering)		Liard	104B/10	Au	Vein/shear	15 ddh; rock and soil geochem, trenching; airborne EM
34	Snip (Delware Resources/ Cominco Ltd.)	104B250	Liard	104B/11E	Au	Mesothermal vein	23 undergd (6828 m) & 145 surf. (11 047 m) ddh; 2433 m drifting road building
35	Johnny Mountain (Reg) (Skyline Explorations)	104B107	Liard	104B/11E	Au,Ag,Cu	Mesothermal vein	41 ddh, 3653 m; geochem, geophys.
36	Inel (Inel Resources/ Skyline Explorations)	104B113	Liard	104B/10W	Au,Ag,Cu, Pb,Zn	Vein, shear	surf. 15 ddh, 2025 m; undergrd 63 ddh. 6199 m; 753 m drifting
37	Zechan (Tanker Oil and Gas)	104B267	Liard	104B/11	Au,Ag,Pb		3 ddh, trenching
38	Eskay Creek (Consolidated Stikine Silver) Calpine Resources)	104B008	Skeena	104B/09W	Au,Ag	Vein?	>13 ddh, 2438 m; soil geochem, prospecting, mapping
39	Kerr (Sulphurets Gold/ Western Canadian Mining)	104B100	Skeena	104B/08	Cu,Au	Porphyry	22 ddh, 3589 m; trenching; geol; geochem;. geophys.
40	Mt. Madge (Corey 8) (Catear Resources/Wydmar, Brucejack/Bighorn Development)	104B240	Skeena	104B/08W	Pb,Zn,Au, Ag	Massive sulphide and vein	6 ddh, 647 m; silt and rock geochem; mapping
41	Gold Wedge (Catear Resources)	104B105	Skeena	104B/08E	Ag,Au	Vein	62 ddh, 30[illegible]; 287 m dec[illegible], 99m drifting
42	Sulphurets (Granduc Mines/ Newhawk Gold Mines)	104B118	Skeena	104B/08E	Ag,Au	Vein	7000 m surface & 7400 m undergrd. ddh; 2000 m drifting; road
43	Tennyson (Keylock Resources)	104B167	Skeena	104B/08E	Au,Ag	Vein	7 ddh, 415 m; trenching, rock geochem
44	Silver Butte	104B083	Skeena	104B/01E	Ag,Au	Vein	undergrd

	(Tenajon Resources/ Esso Resources Canada)						development, 737 m; 23 surface and 36 undergrd ddh, 8502m
45	Big Missouri (Westmin Resources,Canacord Resources, Tournigan Mining Explorations	104B046	Skeena	104B/01	Ag,Au	Vein or volcanogenic sulphide	122 ddh, 11491 m; mapping; road const.; ore stockpiling
46	Indian (Tri Gold Industries, Caltech/ Esso Resources Canada)	104B031	Skeena	104B/01	Ag,Au,Pb, Zn	Vein	ddh
47	High Ore - Ruby Silver (Esso Resources/road; Westmin Resources)	104B090	Skeena	104B/01	Ag,Au	Vein	9 ddh, 707 m; geochem; geophys
48	Silbak Premier (Silbak Premier Mines, Westmin Resources, Canacord Resources)	104B054	Skeena	104B/01E	Ag,Au, Pb,Zn,Cu, Cd	Vein	ddh; undergd.- 7933 m, surface 2411 m; mapping; undergd rehab.
49	Doc(Globe) (Magna Ventures, Silver Princess Resources/ Echo Bay Mines)	104B015	Skeena	104B/08	Au,Ag,Cu, Pb,Zn	Vein	32 ddh, 3050 m; 245 m of underground development
50	Knip (Pennilane Development)	104A095	Skeena	104A/5W	Ag,Pb,Zn	Vein	4 ddh, 366 m
51	Todd Creek (Golden Nevada Resources/ Noranda Exploration Company)	104A001	Skeena	104A/04	Cu,Au	Vein	39ddh, 4239 m; IP; rock, soil, silt, heavy mineral geochem
52	AM, Virginia K (Fest Resources/ Golden Glacier Resources)	104A006	Skeena	104A/05W	Au,Ag	Vein	6ddh, 457 m
53	Joutel(Red Cliff) (Joutel Resources/ B. Hall)	104A037?	Skeena	104A/04	Au,Cu	Vein	4 ddh, 823 m; soil geochem
54	Dunwell Mine (Silver Princess Resources/ Duchan Enterprises)	103P052	Skeena	103P/13W	Au,Ag	Vein	10 ddh, 1372 m; underground rehab. 259 m; stope sampling
55	Glacier Creek (Morocco Explorations/ C. Dyakowski)	103P055	Skeena	103P/13W	Ag,Pb	Vein	3 ddh, 305m
56	Georgia River (Avatar Resources)	103O013	Skeena	103O/16	Au,Ag,Pb, Zn,Cu	Vein	156 ddh, 2629 m; trenching
57	Anyox (Cominco)	103P021	Skeena	103P/05	Cu,Au,Ag	Volcanogenic massive sulphide	7 ddh, 3600 m; geolo.
58	Granby Point (Prospectors Airways/ Pacific Geo-Rock Exploration)	103P022	Skeena	103P/05W	Au	Silicified zones	planned 4 ddh, 610 m; mapping; trenching
59	Tidewater (Richmark Resources/ Orequest Consultants)	103P111	Skeena	103P/05	Ag,Au	Vein	ddh, 611 m
60	Kit (Cominco)soil geochem	103P245	Skeena	103P/11	Ag	Shear zone	3 ddh, 600 m;
61	Dunira Island (St. Edwards Minerals/ Orequest Consultants)	103J044	Skeena	103J/07	Cu,Au,Ag, Wo	Massive sulphide	4 ddh, 240 m
62	Porcher Island (Cathedral Gold)	103J029	Skeena	103J/02	Au	Mesothermal vein	64 ddh, 10652 m; IP; geochem; geol.
63	Yellow Giant (Trader Resource/ Hillsborough Resources)	103G024	Skeena	103G/08	Au	Vein	2 ddh, 70 m bulk sample
64	Surf Inlet (Matachewan Consolidated Mines/ Surf Inlet Mines)	103H027	Skeena	103H/02W	Au,Ag,Cu, Pb,Zn	Vein	3 ddh, 457 m; 610 m underground rehabilitation
65	Western Copper Mines (Freemont Gold)	103H033	Skeena	103H/01	Au,Ag	Vein	10 ddh, 914 m; rock geochem
66	Kalum Lake (Terracamp Developments)	103I019	Skeena	103I/10	Au,Ag	Vein	66 m drifting; trenching
67	Thorn (Castello Resources)	103I098	Skeena	103I/08	Au,Ag,Cu, Pb,Zn,Wo	Vein	16 ddh, 1219m
68	J.P. Group (W. McRae/F. Loutitt	103I107	Omineca	103I/08E	Au,Ag,Pb, Cu	Vein	Underground rehabilitation,

	Univex Mining)						road; geochem.; geol
69	Al (Energex Minerals)	094E091	Omineca	094E	Au	Epithermal vein	70 ddh, 6800 m; trenching
70	JD (Energex Minerals)	094E065	Omineca	094E	Au,Ag	Epithermal	trenching
71	Mets 1 and 2 (Manson Creek Resources/ Golden Rule Resources)	094E093	Omineca	094E/06	Au,Ag	Epithermal	7 ddh, 1156 m; trenching
72	Moosehorn (Cassidy) (Cyprus Metals)	094E086	Omineca	094E/6E	Ag,Au,Pb, Zn,Ba	Epithermal	13 ddh, 1219 m; IP; mag.
73	Golden Stranger (Western Horizons Resources Sutton Resources, Redfern Resources/Western Horizons Resources)	094E076	Omineca	094E	Au	Epithermal	12 ddh, 1829 m; IP; geochem
74	Silver Pond (Bond Gold Canada)	094E069	Omineca	094E	Au,Ag, Cu	Epithermal	16 ddh, 3700 m; resistivity; rock, soil, stream geochem
75	Lawyers (Cheni Gold Mines)	094E066	Omineca	094E066	Ag,Au	Epithermal vein	underground development; permanent camp, mill; tailings pond
76	Chappelle(Baker) (Multinational Resources)	094E026	Omineca	094E/06	Au	Epithermal	24 ddh, 2272 m; IP; geochem
77	Shasta (International Shasta Resources/ Esso Resources)	094E050	Omineca	094E/02	Au,Ag	Epithermal	31 ddh, 3600 m; VLF; IP; rock and soil geochem
78	Brenda (Canasil Resources)		Omineca	094E	Pb,Zn,Cu, Ag	Epithermal vein	12 ddh, 1219 m; Mag,EM,IP; soil geochem
79	Thutade Lake (Pacific Ridge Resources) Hermes Ventures)	094E013	Omineca	094E/02W	Zn,Pb,Ag, Cu	Skarn	VLF,EM,Mag;geochem,
80	Kemess Creek (Pacific Ridge Resources/ St. Phillips Resources)		Omineca	094E/02	Au,Cu	Porphyry	11 rcdh, 870 m; IP; road; trenching
81	New Kemess (El Condor Resources/ D. Copeland)		Omineca	094E/02	Au,Cu	Porphyry	VLF,Mag,IP; geochem; trenching
82	Croy (Pacific Rim Mining Corporation)	094D015	Omineca	094D/08	Ag,Au,Cu	Vein	6 ddh, 518m
83	Knoll (Goldpac Investments)		Omineca	093M/06E	Au,Ag	Vein	10 ddh,1524 m; geophys; road
84	Max (Accura Resources T.Richards Prospecting)	093M027	Omineca	093M/06	Ag.	Mesothermal	18 ddh, 732 m; geophys; geochem
85	Rocher Deboule (Southern Gold Resources)	093M071	Omineca	093M/04E	Cu,Au,Ag	Vein	14 ddh; underground rehabilitation 792 m, 61 m new drifting
86	Fireweed (Canadian United Minerals)		Omineca	093M/01W	Ag,Pb,Zn	Replacement?, conformable mass. sulphide	45 ddh, 8595 m; geophys
87	Cronin (Southern Gold Resourcer)	093L127	Omineca	093L/15W	Ag,Pb,Zn, Au,Cd,Cu	Vein	3 ddh, 457 m; geophys
88	Victory (Geostar Mining)	093L092	Omineca	093L/14W	Ag,Pb,Zn, Au,Cu	Vein	underground development 61 m
89	Dome Mountain (Teeshin Resources, Canadian United Minerals/Total Energold)	093L022	Omineca	093L/10, 15E	Au,Ag,Pb, Zn	Vein	10ddh, 1338.9 m; IP
90	Gaul (Equity Silver Mines/Teck)	093L256	Omineca	093L/01W	Cu,Ag	Porphyry	6 ddh
91	Bob Creek (Royalstar Resources)	093L009	Omineca	093L/07	Au,Ag,Zn	Vein	ddh in progress
92	Silver Queen (Houston Metals Corp.)	093L002	Omineca	093L/02	Ag,Au,Pb, Zn,Ga,Ge	Vein	underground development, ddh
93	Equity Mine (Equity Silver Mines)	093L001	Omineca	093L/1W	Ag,Au,Cu	Transitional	23 ddh, 4400 m
94	Sibola (Teeshin Resources/	093E074	Omineca	093E/11,14	Au,Ag,Zn	Porphyry	13 ddh, 711 m; geol

	MPD Consultants)						
95	Duk 1-4 (S.Travis/93F/12IP; Chalice Mining Incorporated)		Omineca	093E/9	Au	Epithermal	4 ddh, 366 m; rock and soil geochem
96	Smith-Nash (Consolidated Silver Standard/Fleck Resources)		Omineca	093E/05	Au,Ag,Cu	Vein	13 ddh; trenching channel sampling
97	Rhub 1-13 (Mingold Resources)		Omineca	93F11W, 12E	Au		6 ddh, 1037 m; VLF-EM; rock and soil geochem; trenching
98	Pig (Lac Minerals)		Omineca	93F/7W	Au		2 rcdh, 110 m; rock and soil geochem
99	Klappan (Gulf Canada Resources)	104H020	Omineca	104H/6,7,8	Coal		29 ddh; trenching; coal quality analysis geol mapping
100	Bulkley (A. Mullan/ Atna Resources)	093M095	Omineca	93M/3	Coal		3 ddh, 457 m
101	(Pine Creek) Telkwa Coal (Shell Canada/ Crows Nest Resources)	093L152	Omineca	093L/11E	Coal		14 ddh, 1500 m; road

TABLE 1
CENTRAL DISTRICT - 1988

MAP NO.	PROPERTY/MINFILE NAME (OWNER/OPERATOR)	MINFILE NO.	MINING DIVISION	NTS	COMMODITY	DEPOSIT TYPE	WORK DONE; REMARKS
102	Perkins Peak (Kleena Kleene Gold/Hunter Point Ex)	93N010	Cariboo	92N/14	Au	epithermal	underground exploration, 167 m
103	Duck (Gibraltar Mines)		Cariboo	93A/11,12	Au,Ag,Pb,Zn	replacement vein	6 ddh
104	Nov Group (Malcolm Resources)	93A132	Cariboo	93A/11,12	Au	phyllite-hosted gold	3 ddh, 346 m, trenching, test pits
105	QR (Placer Dome/QPX Minerals)	93A040	Cariboo	93A/12	Au	alkali-porphyry related	66 ddh, 18 980 m, environmental studies, feasibility
106	Maud (Placer Dome)	93A119	Cariboo	93A/12	Au	alkali porphyry	12 ddh, 3660 m
107	Cariboo Bell (E&B Explorations/Imperial Metals)	93A008	Cariboo	93A/12	Au,Cu	alkali porphyry	41 ddh completed, drilling in progress
108	CPW (Pundata Gold)	93A061	Cariboo	93A/12E	Au	phyllite-hosted gold	rdh and ddh, 696 m, metallurgical tests
109	Antler Creek (Rise Resources)	93A055	Cariboo	93A/14,H/3	Au	vein, replacement	12 rdh, 600 m, geophys
110	Kwun (Placer Dome)	93A077	Cariboo	93A/6	Au	alkali-porphyry	7 rdh, 730 m, road related
111	Forks (Armada Gold & Minerals)		Cariboo	93A/7	Au	phyllite-hosted gold	drilling in progress, trenching
112	Tep (Armada Gold and Minerals)		Cariboo	93A/7	Au	phyllite-hosted gold	drilling in progress
113	Jamboree (Imperial Metals)	93A149	Cariboo	93A/7	Au	porphyry related	4 ddh, geophys
114	Frasergold (Sirius Resources/Eureka Resources)	93A150	Cariboo	93A/7E	Au	phyllite-hosted gold	183 m underground exploration, pdh, 1829 m, ddh, 915 m
115	Bob (Lac Minerals)	93B054	Cariboo	93B/13E	Au,Ag	epithermal	10 rdh, 800m
116	Oboy (Lornex Mining)		cariboo	93C/9,16	Au	epithermal	10 ddh, 1000 m, road trenching
117	G South Gabriel Resources)	93G007	Cariboo	93G/1	Au	remobilized vms	17 ddh, 1250 m, trenching, geochem, geophys
118	Cluculz Lake (Nation River Resources/Noranda)		Cariboo	93G/14W	Au	vein, replacement?	5 ddh, 609 m, trenching, geochem, geophys
119	York (Lac Minerals)	93G048	Cariboo	93G/7	Au,Ag	replacement vein	10 rdh, 800 m
120	Hixon Creek (Golden Rule Res/Noranda)	93G014	Cariboo	93G/7,8	Au	vein	5 ddh, 700 m completed, more planned
121	8 Mile Lake (Preido Mines)	93H015	Cariboo	93H/4E	Au	placer	drain lake, stripping and mining
122	Cariboo Gold Quartz (Mosquito Consolidated Gold Mines)	93H006	Cariboo	93H/4E	Au	replacement massive sulphide	over 1560 m underground exploration, pdh and ddh in progress
123	Mt. Tom-Whipsaw (Wells Gold)	93H023	Cariboo	93H/4E	Au	replacement massive sulphide	11 ddh, 1937 m, trenching, geochem, geophys
124	Indian Lake (Noranda)		Cariboo	93H/6	Au	volcanogenic massive sulphide	12 ddh, 900 m, road
125	Com (Castello Resources)	93J001	Cariboo	93J/1W	Au,Cu	volcanogenic massive sulphide	9 ddh, 1000 m
126	Newmac (Jacqueline Gold/Mincord Expln.)	92N030	Clinton	92N/10,15	Au,Cu	porphyry	2 ddh, 328 m, geochem, geophys
127	Pellaire (Lord River Gold Mines)	92O045	Clinton	92O/4E	Au,Ag	epithermal	underground exploration

128	Gaspard Lake (Canamax Resources)		Clinton	92O/7,10	Au	epithermal?	9 ddh, 700 m, trenching, geochem
129	Peewee (Peach Lake Resources)	92P108	Clinton	92P/14	Au	porphyry related?	10 ddh, 1500 m, trenching, geochem, geophys
130	Miracle (GWR Resources)	92P002	Clinton	92P/14	Au	vein	4 ddh, 400 m, trenching, geochem, geophys
131	Quintette (Quintette Coal)	93P019	Liard	93P/3E	coal	sedimentary	51 rdh, 5737 m, 16 ddh, 2345 m
132	Tas (Noranda/Black Swan Gold Mines)	93K080	Omineca	93K/16	Au	porphyry related	20 ddh, 1220 m, trenching
133	Snowbird (Pipawa Explorations/X-Cal Resources)	93K036	Omineca	93K/7,8	Au,Sb	vein	100 pdh, 2500 m, trenching, geochem, geophys
134	Phil-Heidi (BP Resources/Lincoln Resources)	93N194	Omineca	93N/1	Au,Cu	alkali porphyry	36 ddh completed, 6100 m in progress, geophys
135	Takla Rainbow (Cathedral Gold/Imperial Metals)	93N082	Omineca	93N/11	Au	alkali-porphyry related	39 ddh, 7625 m, trenching, geophysics
136	Indata (Eastfield Resources)	93N192	Omineca	93N/6	Au	vein, replacement	23 ddh, 2100 m, trenching, geochem
137	Vega (Canmine Development	94C021	Omineca	94C/3	Au	epithermal/ replacement	8 ddh, geochem, geophys, rehabilitate adit

TABLE 1
KOOTENAY DISTRICT

MAP NO.	PROPERTY OWNER/OPERATOR	MINFILE NO.	MINING DIVISION	NTS	COMMODITY	DEPOSIT TYPE	WORK DONE
143	Howell 1-5, Howe 1-7 Cominco Ltd./Placer Dome Inc.	•	Fort Steele	82G/2	Au	Alt. Syenite	25 rdh 3000 m • •
144	Horseshoe Ridge Crows Nest Resources	•	Fort Steele	82G/15W	Coal	•	13 rdh Target Lower Seams • •
144	3 & 4 Seam Area Crows Nest Resources	•	Fort Steele	82G/15	Coal	•	10 rdh Targetting Up. 3rd Seam • •
144	Burnt Ridge Ext. Crows Nest Resources	•	Fort Steele	82G/15	Coal	•	10 rdh 973 m Up Seams Mist Mt Fm •
144	Mine Services Area Line Creek Mine- Crows Nest Res.	•	Fort Steele	82G/15	Coal	•	27 rdh (approx) for 4100 m Production in 1989 •
147	Bighorn Pit Greenhills Mine/Westar Mining	•	Fort Steele	82J/2W	Coal	•	2 rdh 250 m • •
147	Eagle Slump Greenhills/Westar Mining		Fort Steele	82J/2W	Coal	•	9 rdh 530 m • •
147	Geo Slump Block Greenhills Mine/Westar Mining	•	Fort Steele	82J/2W	Coal	•	15 rdh 1069 m •
•147	Cougar North Greenhills Mine/Westar Mining	•	Fort Steele	82J/2W	Coal	•	9 rdh 1039 m • •
147	North Dump Greenhills Mine/Westar Mining	•	Fort Steele	82J/2W	Coal	•	3 rdh • •
149	Bar Chapleau Resources Ltd.	•	Fort Steele	82G/12	Au	Alt. Syenite	9 ddh 1525 m to Oct.20 • VLF
150	Sullivan (Mark Cr.) Cominco Ltd.	82FNE052	Fort Steele	82F/9E	Pb, Zn	Sedex	1ddh • •
151	Wisconsin Dutch Creek Res. Ltd./ Strato Grol. Eng. Ltd.	82FSE036	Nelson	82F/6&7	Au, Ag	Vein	6 ddh RD 200 m Rehab •
152	Nugget Gunsteel Res. Ltd.	82FSW040	Nelson	82F/3E	Au, Ag, Pb	Vein	Ug. Drifting Mill Planned •
153	Silver Dollar J. Spencer, M. Easly/ Fairbanks Eng. Ltd.	82FSW207	Nelson	82F/3	Au, Ag	Vein	640 m D. Drilling • MAG/EM
154	Arlington Brie Mines Ltd./ South Kootenay Goldfields	82FSW205	Nelson	82F/3	Au	Vein	12 ddh in Progress RD 240m •
155	Yankee-Dundee B.G.M. Div. Energy Inc./ Kingsvale Res. Ltd.	82FSW068	Nelson	82F/6	Au	Qtz. Veins	15 ddh Planned Road, Underg. Dev. VLF/EM
156	Blackcock Mine O'Hara Resources	82F/SW076	Nelson	82F/6E	Au, Ag, Pb, Zn	Vein	244m Crosscut • •
157	Shaft Claims O. Janout & Paryn/ South Pacific Gold Corp.	•	Nelson	82F/6W	Au, Cu	Alt. Diorite	6ddh 763m TP=6 IP
158	Great Western Group Lectos Dev. Ltd./G. Salazar	•	Nelson	82F/6W	Au	Alt. Rhyodac	31ddh Total • •
159	Star Finley Co., Ryan Expl./ Ryan Expl. Co. Ltd.	82FSW083	Nelson	82F/6W	Au, Ag	Alt. Diroite	23 ddh, Additional 2835 m • IP
160	Kenville Mine Alcona Industries Ltd.	82F/SW086	Nelson	82F/6W	Au	Vein	Mill Built • •
161	Comstock-Silver Cup Dragoon Res./Greenstone Res. Ltd.	82F/NW077	Slocan	82F/14	Ag, Pb, Zn	Vein	Crosscut, Drilled to 9th Level • •
162	Bar Goldpac Investments Ltd.	•	Slocan	82F/14	Pb, Zn	Sedex	1 ddh 1770 m • •

163	L.H. Goldpac Investments	82FNW157	Slocan	82F/14W	Au, Cu	Silic. Volc.	11 ddh RD 500 m *
164	Willa Northair Mines Ltd.	82FNW071	Slocan	82F/14W	Au, Cu	Alk., Porph	14335 m in 94ddh, Drifting, Raise *
165	Standard Mine Silver Ridge Resources Inc.	82FNW180	Slocan	82F/14	Ag, Pb, Zn	Vein	Underg. Drilling * *
166	Silvana Dickenson Mines Ltd.	82FNW050	Slocan	82F/14W	Ag, Pb, Zn, Cd	Vein	740 m ddh Mostly UG * *
167	Abbot-Wagner Mikado Resources/Turner Energy	82KNW056	Slocan	82K/11E	Ag, Pb, Zn, Au	Replacement	7625 m 100 ddh Hauled 5000 tons *
168	Winslow Winslow Gold Corp./ Tri County Bldgs. Ltd.	82ENW025	Revelstoke	82K/11	Au	Qtz-Ca Vein	9 ddh 1100m Opened 3 Portals *
169	Goldfinch Windflower Mines/Granges Exp.	82ENW076	Revelstoke	82K/13E	Au	Qtz. Vein	Decline, 2 Levels, 1830 m ddh * *
170	Strebe Esperanaz Exploration	*	Slocan	82F/13	Au	Skarn	15 ddh * *
171	Tillicum Mtn. Esperanza Exploration Ltd.	82FNW234	Slocan	82F/13	Au, Ag	Qtz. Skarn	9100 m (Sur & Ag) Stope Dev. 407 kt Reserves *
172	Giant Cominco Ltd.	82FSW109	Trail Creek	82F/4	Au	Porphyry	15 ddh, 1500 m RD 1000 m Clearing *
173	Rossland Mining Sch. Bryndon Vent. Inc./Antelope Res. Ltd.	82ESW023	Trail Creek	82F/3E	Au	Shear	7 ddh as of Oct.20 RD 1600 m EM/VLF
174	Rossland Claims Bryndon Vent. Inc./Antelope Res. Ltd.	*	Trail Creek	82F/4W	Au	Mass Sulph.	28 ddh as of Oct.20 RD 2000 m 35 km geoph
176	Golden Crown Cons. Boundary Exploration	82ESE032	Greenwood	82E/2E	Au, Ag	Vein	12ddh 610 m 604 m Drifting *
177	Skylark Viscount Resources	82ESE011	Greenwood	82E/2E	Au, Ag, Pb	Vein	680 m DG 1680m Surface ddh Prod. 110 tonnes/day *
178	Sylvester K Kettle River Res./Skylark Res.	82ESE046	Greenwood	82E/2E	Au	Mass. Sulph.	6 ddh * *
179	Star Cominco Ltd.	82ESE089	Nelson	82F/1W	Ag, Pb, Zn	Sedex	* * UTEM
180	Vine Cominco	*	Fort Steele	82G/5M	Pb, Zn	Sedex	2 Deep ddh * *

TABLE 1
SOUTH-CENTRAL DISTRICT 1988

MAP NO.	PROPERTY/MINFILE NAME (OWNER/OPERATOR)	MINFILE NUMBER	MINING DIVISION	NTS	COMMODITY	DEPOSIT TYPE	WORK DONE; REMARKS
181	Brett (Huntington Res/Lacana)	82LSW110	Vernon	82L/4E	Au	Epithermal Vein	26 ddh, 34 pdh - 5737 m, 15 trenching
182	Gold Star (Brican Res Ltd/Brican Res Ltd)		Vernon	82L/4E	Au	Epithermal Vein	15 pdh-1810, geophys
183	White Elephant (Lucky 7/C Brett/Lucky 7 Expln)	82LSW042	Vernon	82L/4E	Au	Vein	5 ddh-494 m, geochem, geophys
184	*Plateau Gold (Quinto Mining/Quinto Mining)	82LSE006	Vernon	82L/7W	Au	Shear	10 ddh-1006 m, underground-488 m, geochem,geophys
185	Bearcub (Brenda Mines/Brenda Mines)		Vernon	82L/2W,7W	Feldspar	Pegmatite	13 ddh-792 m
186	Creighton (Qpx Minerals/Minequest)		Vernon	82L/2	Au	EPI?	ddh-607 m, geochem, geophys, trenching
187	Top (J Irwin/El Paraiso Res)	82LSE017	Vernon	82L/2E	Au	Vein?	12ddh-458 m, geochem, geophys
188	Pita (Mohawk Oil/Approach Res)		Vernon	82L/1W,2E	Au	Vein?	3 ddh-284 m
189	Kalamalka Mine (Triple Star Res/Searchlight Res)	82LSW050	Vernon	82L/3E	Au	Vein	11 ddh-131 m
190	OKA (Fairfield/Placer/Cordil'n)		Osoyoos	82E/13W	Au	Skarn	43 pcdh-5949 m, geochem, geophys
191	Vault (Cdn Nickel/Cdn Nickel)	82ESW173	Osoyoos	82E/5E	Au,Ag	EPI-Vein	49 ddh 18 315 m
192	Dusty Mac (Minnova Inc/Minnova Inc)	82ESW078	Osoyoos	82E/5E	Au,Ag	EPI-Vein	11 ddh-1540 m, trenching, geophys
193	Venner (Lacana/Tigris Minerals)		Osoyoos	82E/6	Au	Vein?	10 ddh-610 m, trenching, geophys
194	Golden Plug (Greenlake Res/Greenlake Res)		Osoyoos	82E/5W	Au	Vein?	ddh-488 m
195	Astro 1, (PDL) (QPX Minerals/Minequest Assoc)		Osoyoos	83E/5W	Au	Vein	2 ddh-320 m, trenching, geochem, geophys
196	*Fairview (Oliver Gold Cor/Oliver Gold Cor)	82ESW008	Osoyoos	82E/4E	Au,Ag	Vein	6 ddh-598 m, underground rehab
197	*Stemwinder (Highland Vlyres/Highland Vlyres)	82ESW007	Osoyoos	82E/4E	Au,Ag	Vein	15 ddh-2855 m, 11 pdh-1846 m, underground
198	Grandoro (H Hatfield/Brightwork Res)	82ESW110	Osoyoos	82E/5E	Au	Vein	30 trenching
199	Dankoe/Ag-Horn (Dankoe Mines/Skylark Res)	82ESW002	Osoyoos	82E/4E			Milling
200	*Nickel Plate (Mascot Gold/Mascot Gold)	92HSE62	Osoyoos	92H/8E	Au	Skarn	30 ddh-1860 m, underground
201	Canty (Golden North/Mascot Gold)	92HSE64	Osoyoos	92H/8E	Au	Skarn	19 ddh-2895 m, geochem,geophys
202	Eagle's Nest (Agio Res Corp/Mascot Gold Ml)		Osoyoos	92H/8E	Au	Skarn?	10 ddh-1000 m
203	Lost Horse,Etc Chevron Canada/Chevron Canada)	92HSE050	Osoyoos	92H/8E	Au	Skarn?	ddh-844 m
204	Hedley Tailings (Candorado Mines/Candorado Mines)		Osoyoos	92H/8E	Au		tailings recovery
205	Mascot Tailings (Sumac Ventures/Sumac Ventures)		Osoyoos	92H/8E	Au	Leach	47 auger + pdh-340m, (tailings)
206	Banbury (Banbury Gold ML/Erickson Gold M)	92HSE046	Sicamous	92H/8E	Au, Ag	Vein	16 ddh-1546 m, underground-drift-148 m
207	Similko (Similco Mines/Similco Mines)	92HSE013	Sicamous	92H/7E	Cu-Au	Skarn Porphyry	ddh, trenching, geophys

208	*Treasure Mt (Huldra Silver/Huldra Silver)		Sicamous	92H/6E development	Ag	Vein	52 ddh-2800 m, underground 2135 m-
209	Summit Camp group (Tarbo/Unicron/Harrisburg-Dytn)	92HSW023	Sicamous	92H/6E	Au,Ag	Vein?	12 ddh-1219m, trenching, geochem, geophys
210	Grasshopper (L Allen/Longreach Res)		Sicamous	92H/10W	PGE	Magmatic Segregation	15P cdh-853 m,
211	Rambler Group (Goldwest Res/Bordeaux		Sicamous	92H/10W	Au?		5 ddh-279 m, trenching, geochem
212	Man (D Mehner/Brican Res Ltd)		Sicamous	92H/9W	Au?		6 ddh-915 m, geochem
213	Elk (Fairfield/Placer/Cordil'n)		Sicamous	92H/16W	Au	Skarn	11 trenching, geochem
214	Snowflake (Quilchena Res/Gerle Gold)	92HNE145	Nicola	92H/15E	Au	Vein Breccia	3 ddh-305 m
215	Stump Lake (Celebrity/Minnova)		Nicola	92I/8W	Au	Vein	8 ddh-1150 m, geophys
216	Mary Reynolds (L Loranger/J Dawson)	92ISE115	Nicola	92I/8W	Au	Vein	4 ddh-600 m
217	Lucky Mike (W Petrie/Corona Corp)		Nicola	92I/7	Au	Skarn	13 ddh-762 m, trenching, geochem,geophys
218	HK (H Kruse/H Kruse)		Nicola	92I/2	Au	Skarn?	5 ddh-244 m geochem,geophys
219	Betty Lou (Better Res/J Bristow)		Nicola	92I/2	Au		1 ddh-289 m, geophys
220	Crescent (Afton OoperatingAfton Operating)	92INE026,30	Kamloops	92I/9W	Cu-Au	Porphyry	23 ddh-1968 m, pit development
221	Sunny (Afton Op Corp/Teck Expl'n)		Kamloops	92I/9W	Cu-Au	Porphyry	2 pdh-213 m
222	M & R (Afton Operating/Afton Operating)		Kamloops	92I/10E	Cu-Au	Porphyry	3 pdh-233 m
223	Galaxy (Abermin/Abermin)	92INE007	Kamloops	92I/9W	Au-Cu	Porphyry	13 ddh-1944 m
224	F.D. 1 (F Denis/B M Drilling)		Kamloops	92I/9E	Au?	1 pdh-117 m	
225	JG-1 (H Adams/H Adams)		Kamloops	82L/5W	Au	Vein?	2 ddh-76 m
226	Andy 1 (A Babiy/A Babiy)		Kamloops	92I/10E			2 ddh-155 m
227	Mara (QPX Minerals/Minequest)	Vein	Kamloops	92I/9,16	Au	Epithermal	4P cdh-366 m, geochem, geophys
228	Samatosum JV (Minnova/Rea/Minnova)	82M244	Kamloops	82M/4W	Ag	Massive Sulphides	32 ddh-5652 m, pit development
229	Rea Discovery (Rea Gold Corp/Rea Gold Corp)	82M191	Kamloops	82M/4E	Au,Zn,Cu	Massive Sulphides	ddh, underground development
230	Bar/Chu Chua (Minnova Inc/Minnova Inc)	82M062	Kamloops	82M/4W,5W	Au,Ag,Znpb	Massive Sulphides	22 ddh-2450, geophys,geochem
231	Twin (Esso Res Cda/Esso RES CDA)	82M020	Kamloops	82M/4W	Au,Ag	Massive Sulphides	8 ddh-1272 m, geochem, geophys
232	Kamad/Homestake (Kamad/Esso/Esso Res Cda)	82M025	Kamloops	84M/4W	Au,Ag,Ba	Massive Sulphides	17 ddh-2113 m, 1 trenching, geochem, geophys
233	Bay (Cominco Ltd/Falconbridge)	82M053	Kamloops	82M/4E	Au,Ag	Massive Sulphides	15 trenching, geochem, geophys
234	Lucky Coon	82M012	Kamloops	82M/4E	Au,Ag Zncu	Volcanogenic Massive Sulphide	
235	Adam, Wad (Adams Expln/Spencer Engrg)	82M193, 212+	Kamloops	82M/4E	Au,Ag	Massive Sulphides	11 ddh-1162 m, geochem, geophys
236	Steep (Nat Res Expln/Discovery Consl)		Kamloops	82M/20W	Au,Ag	Skarn Massive Sulphides	5 ddh-1050 m

237	Cana (Shamrock Res/Esso Res Cda)		Kamloops	82M/4W	Au,Ag	Massive Sulphides	4 ddh-480 m
238	White Rock (Nre/2 Nre/Discovery	82M066	Kamloops	82M/5W	Au,Ag	Massive	8 ddh-155 / m
239	CM (Bp Minerals/Bp Res Canada)		Kamloops	92P/8E	Au	Massive Sulphides?	17 ddh-1900 m, 8 trenching, geophys
240	Gold Hill (Minnova Inc/Minnova Inc)	92P041	Kamloops	92P/8E	Au	Vein	6 ddh-1050 m
241	Windpass (Kamad Silver/Kerr-Addison Ml)	92P039	Kamloops	92P/8 geochem,geophys	Au,Ag	Vein	12 ddh-2328 m, 13 trenching,
242	Foghorn Mt (Gold Spring Res/Gold Spring Res)	82M029	Kamloops	82M/12W	Au-Ag-PbZn	Massive Sulphide Breccia	14 ddh-1500 m, geochem
243	Nobel (Placer-Dome/Placer-Dome)		Kamloops	82M/12	Au,Ag,Zn	VMS	4 ddh-953 m, geophys
244	CK (Rea Gold Corp/Rea Gold Corp)	82M137	Kamloops	82M/13E	Pb,Zn	Sedex	24 ddh-3754.5 m, trch, gc, gp
245	Scotch (Brican/Brican)		Kamloops	82L/13,14	Au	VMS?	6 ddh-1220 m
246	*J & L (Pan American/Equinox Res Ltd)	82M003	Revelstoke	82M/8E	Au,Ag,ZnPb	Sedex	underground 160 m-raise, 183 m-drift
247	EPI,Yard,Gnome (M Dickens/Cdn Nickel)		Clinton	92P/2W	Au		3 ddh-880 m
248	Vidette (Tugold Res/Booker Gold)	92P85,86,87	Clinton	92P/2W	Au,Ag	Vein	5 ddh-457 m, geophys
249	Eastmo Group (C Boitard/C Boitard)		Clinton	92P/2W	Au	Vein?	2 ddh-500 m?
250	750M (G.Ellerbeck/Titan)		Kamloops	92P/8E	Au?	Vein?	4 ddh-232 m
251	Haida Gold (Electrum Res/Vital Pacific)		Kamloops	92P/9W	Au		16 ddh-1920 m, geophys
252	Ta Hoola (Smdc Ltd/Rat Res Ltd)		Kamloops	92P/9	Au		4 ddh-600 m, geochem
253	Bogg (G Rayner&Assoc/Geotech Cap Cor)		Kamloops	92P/9,10	Au?	Vein?	6 ddh-914 m, geochem
254	HC (Bp Res Cda Ltd/Lancer Res Inc)		Kamloops	92P/9	Au	Vein	8 ddh-711 m
255	*Bralorne (Cda Trust/Mascot)	92JNE01,2,7 underground	Lillooet	92J/15W	Au	Vein	60 ddh-9924 m (approx), surface +
256	*Congress (Levlon Res/Levon Res)	92JNE029	Lillooet	92J/15W	Au	Vein	38 ddh-2793 m, drift + raise-1537m
257	Minto (Avino Mines/Avino Mines)	92JNE075	Lillooet	92J/15W	Au	Vein	9 ddh-793 m, trenching, geochem
258	Olympic (D Ingram/Avino Mines/Res)	2JNE092	Lillooet	92J/15W	Au	Vein	6 ddh-830 m, 6 trenching, geochem
259	Golden Sidewalk (Manhatten Miner/Manhatten Minrl)		Lillooet	92J/15E,W	Au	Vein	12 ddh-1676 m
260	LJ (Hoyle Res/Hoyle Res)		Lillooet	92J/15E	Au	Vein	5 ddh-455 m,
261	Reliance (C Boitard/Menika)	92JNE33	Lillooet	92J/15W	Au	Vein	21 ddh-3350 m
262	Wayside (Chevron/Chevron)	92JNE030	Lillooet	92J/15W geophys	Au	Vein	13 ddh-2084 m, 10 trenching, geochem,
263	Gun Creek (Mt Allard Res/Hi-Tec Res)		Lillooet	92J/15W	Au	Vein?	3 ddh-194 m
264	*Love Oil/Cosmo (Love Oil/Levon Res)		Lillooet	92J/15W	Au	Vein	Drift-193 m, 31 trenching- 750 m,geochem,geophys

265	Bristol Gold (Westmin Res Ltd/Westmin Res Ltd)	Lillooet	92J/15E	Au	Vein?	17 ddh-2500 m, 4 trenching, geochem
266	Relay Creek (Esso Res Cda Ld/Esso Res Cda Ld)	Lillooet	92O/2	Au	Vein?	8 ddh-1079 m
267	Eva (Abermin Corp/Millennium Res)	Lillooet	92O/2W	Au	Vein	1 ddh-387 m
268	Bobcat (Lexington Res/Lexington)	Clinton	92O/7E	Au,Ag	Epithermal Vein	12 ddh-2006 m, trenching, geochem
	Sturrup, Watson (Chevron Mineral/Chevron)	Clinton	92O/1	Au		12 ddh-427 m, 6 trenching, geochem, geophys
269	Stirrup Creek (Chevron)	Clinton	92O/1E	Au		2 ddh-427 m, 6 trenching, gc,gp
270	Edge (Brenwest Mining/Hi-Tec Res Mgmt)	Clinton	92O/1	Au?		11 ddh-1524 m, 22 trenching, geochem
271	Spray, Foam	Lillooet	92I			

TABLE 1
SOUTH WESTERN DISTRICT

MAP NO.	PROPERTY/MINFILE NAME (OWNER/OPERATOR)	MINFILE NO.	MINING DIVISION	NTS	COMMODITY	DEPOSIT TYPE	WORK DONE; REMARKS
272	Valentine Mountain/Blaze (Beau Pre Explorations/ Valentine Gold)	092B108	Victoria	92b/12w	Au,Ag	veins	15 ddh, 2477 m; more drilling planned; 20 tpd test mill processed 391 tonnes; geophys.
273	Mount Sicker/Lenora, Tyee, Copper Canyon (Minnova)	092B001, 002004 08689,099	Victoria	92B/13E, 13W	Au,Ag, Cu,Zn,Pb	massive sulphides	17 ddh, approx. 5500 m; more drilling planned, mapping
274	Lara/Coronation, Hope (Laramide Resources/ Abermin)	092B110	Victoria	92B/13W	Au,Ag,Zn, Cu,Pb	massive sulphides	Approx. 600 m underground development; 10 000 tonne bulk sample stockpiled; 3 ddh, 268 m
275	Chemainus/Anita, Pauper (Esso Minerals/ Falconbridge)	092B037, 040	Victoria	92B/13W 92C/16E	Au,Ag,Zn, Cu,Pb	massive sulphides	34 ddh, 10 188 m; more drilling planned; mapping; geophys.; trenching
276	Mount Vernon/Avallin (Nuspar Resources)	092C037	Victoria	92C/15E 92C/16W	Au,Cu	siliceous stockwork, skarns	12 ddh; 6 rdh
277	Heather (International Cherokee/ Minnova)	092C127	Victoria	92C/16W	Cu,Au	shear zone, veins	7 ddh, 542 m
278	Snapper (Ruza Resources/Saga Resources)		Victoria	92F/2E	Au,Ag	veins	5 ddh, 541 m
279	Contact/Ormond (Parallax Development, Au Resources)	092E012, 033, 034	Alberni	092E/8E	Au,Ag,veins Pb,Zn		18 ddh; geochem.; geophys.
280	Head Bay/Road (Centaur Resources)	092E063	Alberni	O92E/15E	Au,Cu,Ag	veins	Approx. 300 m drilling; prospecting; geochem.
281	Thistle (Nexus Resource Corp., Angle Resources/Nexus)	092F083	Alberni	O92F/2E	Au,Ag,Cu,	massive sulphides	7 ddh, 1205 m
282	Debbie,Yellow/Regina, Victoria (Westmin Resources, Nexus Resource Corp.)	092F078, 079	Alberni	92F/2E 92F/7E	Au,Ag,Cu	altered shear zone auriferous chert quartz vein stockwork	Underground exploration, 2020 m tunnel in progress; diamond drilling planned; mapping
283	Bear/Bear,Ironsides, Olympic (International Coast Minerals /INP Expl. & Development)	092F044, 045,046	Alberni	92F/3W	Au,Ag,Cu	Tertiary mesothermal	Diamond drilling; geophys.; trenching
284	Buttle Lake (Cream Silver Mines)		Alberni	92F/5E, 12E	Au,Ag,Pb, Zn, Cu	massive sulphides	4 ddh, 2163 m
285	Tay (Dalmation Resources)		Alberni	92F/6W	Au breccias	veins, siliceous	Diamond drilling; geophys.; geochem.
286	New Privateer/Privateer (New Privateer Mines)	092L008	Alberni	92L/2W	Au,Ag	Tertiary mesothermal veins	Bulk sampling; mail construction
287	Spud Valley/Goldfield (McAdam Resources)	092L211	Alberni	92L/2W	Au,Ag	Tertiary mesothermal veins	Underground drifting underground ddh, 5400 m
288	Hiller-Churchill (Falconbridge/Footwall Explorations)	092L031, 127, 154	Alberni	92L/2W	Au,Ag,Cu, Magnetite	skarn	Drifting & raising; sampling; mapping
289	Iron Cop (Defiant Minerals)	092L228	Alberni/ Nanaimo	92L/5E	Au,Ag,Cu	veins	3 ddh, 244 m; mapping; geophys.; geochem.
290	Songbird/Okay (Expeditor Resource Group/ Mingold Resources)	092F055	Nanaimo	92F/1E	Au,Ag	veins	Reverse circulation drilling; geophys.; geochem.; trenching

291	Aladdin/Venus,St.Joseph, Juneau, Old Bill (H.Q.Minerals,Dornoch Int.)	092F131, 132134	Nanaimo	092F/8W, 9W	Au,Cu,Ag	veins in shear zones	6 ddh, 427 m; geophys.; geochem.
292	Vananda Gold/Little Billie,Cornell,Copper Queen, Texada Iron (Vananda Gold,Freeport-McMoran Gold)	092F105, 106,107,112, 257259	Nanaimo	92F/10E, 15E	Au,Ag,Cu,Zn, Magnetite	skarn	mapping; airborne & ground geophys.; trenching; diamond drilling planned
293	Mount Washington/ Domineer,Lakeview (Better Resources)	092F116, 117,330	Nanaimo	92F/11E,11W 92F/14E/14W	Au,Ag,Cu,As	epithermal veins, breccias	67 ddh, 5392 m; trenching; geochem.
294	Murex (Better Resources/ Noranda Exploration)	092F206	Nanaimo	92F/11E,11W 92F/14E,14W	Au,Ag,Cu	mineralized breccia	9 ddh, approx. 800 m; mapping geochem.; geophys.
295	Dove J. Paquet/Visible Gold, Westmin Resources)		Nanaimo	92F/11E 92F/14E,14W	Au,Ag,As,Cu	epithermal veins, breccias	Approx. 4,900 m diamond drilling planned
296	Forbidden Plateau/ JoAnne, Elnora (Iron River Resources/ Noranda Exploration)	092F309, 329	Nanaimo	92F/11W, 14W	Ag,Cu,Au,Pb	epithermal veins, breccias	8 ddh, approx. 900 m
297	McIvor Lake (Canadian Occidental Petroleum)	092K138	Nanaimo	92F/14W 92K/3W	Coal	sedimentary	8 rdh
298	Quadra/Contact (Nation River Resources/ Lone Jack Resources)	092K/085	Nanaimo	92K/3E,3W	Au,Ag,Cu	skarns	8 ddh, 386 m; trenching
299	Andy,Joe/Smith Copper (West-Mar Resources/ Hercules Ventures)	092I.037, 208	Nanaimo	92L/7W	Cu,Pb,Zn, Ag,Au	skarn	Diamond drilling; geophys.; geochem.; trenching
300	Expo/Hep,Expo (BHP-Utah Mines/ Moraga Resources)	092I.078, 240	Nanaimo	92L/12W	Cu,Mo,Au	porphyry copper-gold	Diamond drilling; geophys.; geochem.; trenching
301	Red Dog (Crew Natural Resources)	092L200	Nanaimo	92L/12W	Cu,Au,Mo	porphyry copper-gold	4 ddh
302	Realgar (Lone Trial Prospecting/ Formosa Resources)		Nanaimo	102I/9E	As,Cu,Hg	skarn, epithermal veins	4 ddh, approx. 245 m; geochem.; geophys.
303	Lang Bay (Fargo Resources, Brenda Mines)	092F137	Vancouver	92F/16W	Kaolin,Ge,Ga	residual, sedimentary	Diamond drilling; product beneficiation tests; geophys.
304	Fleck-Britannia/ Victoria, Bank of Vancouver, (Minnova)	092G NW-003, 004	Vancouver	92G/10W,11E	Cu,Zn,Pb,Ag,Au	volcanogenic massive sulphides	11 ddh, 1446 m; mapping; geophys.; geochem.
305	International Maggie/ Indian River Copper,ABC, War Eagle (Minnova)	092G NW024, 028, 042	Vancouver	92G/10W,11E	Cu,Zn,Pb, Au,Ag	volcanaogenic massive sulphides	5 ddh, 1823 m; mapping
306	Sechelt Wollastonite/ Snake Bay, Wormy Lake (Tri-Sil Minerals/ Canamin Res., Lone Jack Resources)	092G NW052, 053	Vancouver	92G/12W	Wollastonite	skarn	16 ddh, 1087 m; trenching
307	Ashlu Mine/Ashloo (Tenquille Resources/ Valentine Gold)	092G NW013	Vancouver	92G/14W	Au,Ag,Cu	vein	9 short underground ddh; prospecting; geophys.
308	Northair/Warman (Northair Mines/ Falconbridge)	092J/ W012	Vancouver	92J/3E	Au,Ag,Cu, Pb,Zn	vein, massive	5 ddh, 1635 m; surface & underground mapping; geophys.
309	White Pine (Rea Gold, Verdstone Gold)	092K036	Vancouver	92K/6W	Au,Ag	veins	13 ddh, 1163 m
310	Sky/Spanar	092G	N.W.Minst.	92G/8W	Au,Ag	vein	1 ddh, approx. 100 m

	(Skyrocket Exploration) SE019						
311	Toil/Brem (Diamond Resources/ LMX Resources)	092G NE024	N.WMinst.	92G/9E	Cu,Pb,Zn	disseminated volcanogenic sulphides	3 ddh, approx. 400 m
312	Doctor's Point/Nagy (Rhyolite Resources/ Universal Trident Industries)	092H NW071	N.WMinst.	92G/9E 92H/12W	Au,Ag	epithermal veins	Diamond drilling; mapping sampling; geophys.; geochem.; trenching
313	Easy & Jo/Mayflower (Hillside Energy, Symes Resources, Corona)	092G NE010	N.WMinst.	92G/16W	Au,Ag,Pb,Zn	mineralized volcanic breccia	Diamond drilling; geochem.; mapping; prospecting
314	Giant Copper/AM (Bethlehem Resources)	092H SW001	N.WMinst.	92H/3E	Cu,Au,Ag,Mo	breccia pipe	Underground & surface diamond drilling
315	Abo (Harrison Lake)/GEO, RN (Bema Int. Resources, Abo Resource Corp., Kerr Addison Mines)	092H SW092	N.WMinst.	92H/5E,5W	Au	vein stockwork	Underground & surface diamond drilling; mapping; geophys.; geochem.
316	Gilt Creek/Gold Cord (New Lintex Minerals)	092H NW031	N.WMinst.	92H/11W	Au	mineralized felsic dykes	Diamond drilling; geophys.; geochem.
317	North Fork (Minnova)	092H NW(070)	N.WMinst.	92H/12W	Cu,Zn,Ag	massive sulphides	Diamond drilling
318	Lill/Eagle,Lake,Boulder (Green Lake Resources)	092J/ SE008, 009,010	Lillooet	92J/7E	Cu,Zn,Ag,Au	massive sulphides skarns	Approx. 13 ddh, 2000 m; geophys.; geochem.; trenching
319	Eagle,Raven/Last Chance, Swede (Diamond Resources)	103B003, 009	Skeena	103B/12W	Cu,Ag,Au	shear zones	3 ddh, approx. 300 m
320	Lockport/Locke (Foundation Resources Skygold Resources	103B066	Skeena	103B/12W	Au	epithermal alteration zone	9 ddh 225 m
321	Cinola (City resources (Canada))	103F034	Skeena	103F/9E	Au,Ag	epithermal veins, breccia	52 ddh, 4073 m; metallurgical testing; feasibility study; geophys.
322	Inconspicous Radcliffe Resources/ City Resources (Canada))	103F-043 044	Skeena	103G/4E 15W	Au	altered shear zones	6 ddh, 440 m
323	More/Bella,Marino Cominco	103G008 028	Skeena	103G/4E	Au,Sb	epithermal veins	34 pdh
324	Snow/Baxter creek (Mondavi Resources)	103G005	Skeena	103G/4W	Au,Ag	epithermal veins	6 ddh

TABLE 2
ACTIVE MINES IN THE NORTHWESTERN DISTRICT, 1988

MAP NO.	PROPERTY/MINFILE NAME (OWNER/OPERATOR)	MINFILE NO.	MINING DIVISION	NTS	COMMODITY	DEPOSIT TYPE	WORK DONE
16	Erickson Gold	•	Liard	104P/4E	Au	Vein	250 tpd; Reserves: 23 Kt @ 34.3 g/t Au
35	Johnny Mountain (Reg)	•	Liard	104B/11E	Au, Ag, Cu	Vein	180 tpd, 24 Kt milled; Reserves: 984 Kt @ 22.1 g/t Au
93	Equity Silver	•	Omineca	93L/1W	Ag, Au, Cu	Transitional	30 000 tpd; Reserves: 12.13 Mt @ 85.5 g/t Ag, 1.12 g/t Au, 0.25% Cu
102	Cassiar Mine	•	Liard	104P/5E	Asbestos	Ultramafic	1.45 Mt (Jan-Nov 88) at Reserves 2.04 Mt
103	Taurus	•	Liard	104P/5E	Au, Ag	Vein	Mill closed in December Tested Hopeful Zone
104	Bell	•	Omineca	93M/1W	Cu, Au	Porphyry	with Ag and Cu 15 000 tpd; Reserves: 18.3m Mt @ 0.51% Cu with Au

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TABLE 2
ACTIVE MINES IN CENTRAL DISTRICT - 1988

MAP NO. DATA	PROPERTY/MINFILE NAME OWNER/OPERATOR)	MINING DIVISION	NTS	COMMODITY	DEPOSIT	PRODUCTION AND DEVELOPMENT
138	Bullmoose	Liard	93P/4E	coal		Production: 1.7Mt metallurgical coal. Development and production drilling. Reserves: 68.7Mt metallurgical coal.
139	Quintette	Liard	93P/3E	coal		Production: 4.45Mt metallurgical coal. Development and production drilling, 20 000m. Reserves: 231 Mt metallurgical coal, 20.5 Mt thermal coal.
140	Endako	Cariboo	93K/3E	Mo	porphyry	Milled 9.0 Mt ore @ 25 000 tpd. Reserves: 128Mt @ 0.081% Mo.
141	Gibraltor	Cariboo	93B/4E	Cu,Mo		Milled 5.0 Mt ore @ 40 000 tpd. and produced 4.22 kt heap leach/cathode copper. Reserves0: 200 Mt @ 0.31% Cu, 0.009% Mo.
142	Blackdome	Clinton	920/7,8	Au,Ag	epithermal vein	Milling rate: 200 tpd. Over 2 250 m underground development. Reserves: 180KT @ 25.5 g/t Au, 74.0 g/t Ag.

TABLE 2
KOOTENAY DISTRICT TABLE OF PRODUCERS

MAP NO.	PROPERTY/MINFILE NAME (OWNER/OPERATOR)	MINFILE NO.	DIVISION	NTS	COMMODITY	DEPOSIT TYPE	WORK DONE; REMARKS
144	Coal Mountain (Byron Creek Collieries)	82G/7, 10	Fort Steele	114 40'	coal		Production: 0.9 Mt thermal coal
145	Balmer (Westar Mining)	82G/10, 15	Fort Steele	114 49'	coal		25 925 m development drilling in pit; Production: 5.7 Mt metallurgical coal, 75 kt thermal coal
146	Line Creek (Crows Nest Res.)	82G/15W	Fort Steele	114 46'	coal		Production: 1.2 Mt metallurgical coal, 0.6 Mt thermal coal
147	Greenhills (Westar Mining)	82J/2	Fort Steele	114 52'	coal		Produced 2.2 Mt metallurgical coal, 0.54 Mt thermal coal, 0.31 Mt special-blend coal
148	Fording River (Fording Coal)	82J/2W	Fort Steele	114 53'	coal		Production: 4.6 Mt metallurgical coal, 0.35 Mt thermal coal
150	Sullivan (Cominco)	82F/9E	Fort Steele	116 00'	Pb, Zn, Ag	sedex	Reserves: 24 727 kt @ 4.6% Pb, 7.1% Zn, 29 g/t Ag
166	Silvana (Dickenson Mines)	82F/14W	Slocan	117 15'	Ag, Pb Zn, Cd	vein	Milling rate: 90 tpd; Reserves, 43 kt @ 433 g/t Ag, 5.0% Pb, 5.8% Zn
175	Union (Sumac Ventures Ltd.)	82E/9W	Greenwood	118 21'	Au, Ag	heap leach	Production: 8 kg Au, 243 kg Ag to August
177	Skylark (Viscount Res.)	82E/2E	Greenwood	118 38'	Au, Ag Pb, Zn	vein	Milling rate: 110 tpd; Reserves: 54.5 kt @ 924.5 g/t Ag, 3.4 g/t Au

TABLE 2
SOUTH - CENTRAL DISTRICT 1988
EXPLORATION/DEVELOPMENT PROJECTS
IN THE MINE
DEVELOPMENT REVIEW PROCESS

PROJECT	COMMODITY	ORE RESERVES (ALL CATEGORIES)	PRODUCTION RATE (tpd)	CAPITAL COST ($000)	DEVELOPMENT SCHEDULE	MDRP STAGE	OPERATOR
Bralorne	Au	965 000 t @ 9.37 g/t Au	272 4 Yrs	$ 5,000	1989	PRE I	Corona Corp
Congress	Au, Ag	450 819 t @ 9.98 g/t Au	227 8 Yrs	$ 5,000 (est.)	1989	PRE I	Levon Resources
Samatosum	Ag, Pb,	609 814 t @ 1062 g/t Ag	465 5-7 Yrs	$ 25,000	Fall 1988	III (AIP)	Minnova Inc
Ajax/Afton	Cu, Au	24.5 Mt @ 0.46% Cu 0.34 g/t Au	10 000 7 Yrs	$ 11,000	1989	II?	Afton Operating
Crescent/Afton	Cu, Au	1.07 Mt @ 0.46% Cu	10 000 4 Mos	$ 300	1988	III (AIP)	Afton Operating
Lumby	Au	232 217 t @ 3.94 g/t Au	227 7 Yrs	$ 3,000 (est.)	Uncertain	I	Quinto Mining
Oliver Gold	Au, Ag	691 210 t @ 3.77 g/t Au	272 10 Yrs	$ 14,000	1989	PRE I	Oliver Gold
Hedley Tailings	Au	1.7 Mt @ 1.37 g/t Au	4500 2 Yrs	$ 3,140	1988	III (AIP)	Candorado Mines
Mascot Tailings	Au	621 363 t @ ?	635 5 Yrs	?	Uncertain	PRE I	Sumac Ventures
Pacific Talc	Talc	0.43 Mt	100 3 Yrs	?	1989	III (AIP)/87)	Pacific Talc Ltd

TABLE 2
ACTIVE MINES IN BRITISH COLUMBIA, 1988
(MAP NUMBERS ARE KEYED TO FIGURE 3)

MAP NO.	PROPERTY/MINFILE NAME (OWNER/OPERATOR)	MINFILE NUMBER	MINING DIVISION	NTS	COMMODITY	DEPOSIT TYPE	PRODUCTION, DEVELOPMENT, EXPLORATION
325	Myra Falls/Lynx,Myra Price (Westmin Resources)	092F071, 072,073	Alberni	92F/12E	Cu,Zn,Pb, Ag,Au	volcanogenic sulphides	Continued in full production at both H-W and Lynx mines; milling capacity expanded by 33% to present rate of 4000 total reserves in all categories at start of 1988, 12.5 Mt @ 2.40% Cu, 0.36% Pb, 5.28% Zn, 2.4 g/t Au, 37.7 g/t Ag; exploration drilling continues underground at H-W and Lynx mines.
326	Island Copper/Bay (BHP-Utah Mines)	092F062 099,135-	Nanaimo	92L/11W	Cu,Mo,Au	porphyry	Continued full production at approx. 45 000 tpd; proven reserves accessible with current pit estimated to be approx. 30 Mt; decision to push back south wall to access additional 4 years' reserves is still pending; exploration drilling continues in effort to define new reserves on mine property.
327	Quinsam (Quinsam Coal)	092F319	Nanaimo	92F/14W	Coal	sedimentary	Producing thermal coal at a steady rate of 15 000 t/month through 1988 for sale to B.C. cement industry.

NORTHWESTERN DISTRICT

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INTRODUCTION

Exploration activity continued at near record levels in northwestern British Columbia with expenditures in excess of $85 million. The number of Notices of Work declined 10 per cent from 1987 to a total of 288. Strong metal prices, readily available risk capital and exciting new finds were the principal reasons for the continuing boom in exploration and mine development.

The Stewart - Iskut River gold belt was the busiest exploration area in the district with expenditures exceeding $43 million on more than 55 properties, including 29 major projects. British Columbia's new producer in 1988, the Reg (Johnny Mountain) gold mine, is located in this area. The Silbak Premier - Big Missouri and Snip precious metal deposits are also being developed for production in 1989.

Two other gold deposits, Lawyers in the Toodoggone area and Golden Bear northwest of Telegraph Creek, are being developed for production in 1989. In Cassiar the McDame asbestos deposit is expected to be ready to replace the Cassiar open-pit production in 1990. A total of $97 million was spent on seven development projects in northwestern British Columbia.

Coal exploration consisted of four exploration programs on known deposits including Mount Klappan and Telkwa. Placer mining continued at virtually the same levels as in previous years. New operations started in the Omineca and Skeena Mining Divisions roughly equaled the 20 per cent reduction in Notices of Work filed from the Liard Mining Division.

Equity Silver, Bell, Reg, Taurus and Erickson Gold were the five operating metal mines and Cassiar Mining Corporation continued to produce asbestos from its open-pit. Both Total Energold Corporation and Taurus Resources Ltd. shut down their mills in December pending development of new ore zones.

HIGHLIGHTS

* Extensive drilling and initial underground drifting completed through copper-cobalt-gold mineralization in the **Windy Craggy** orebody.
* Exploration for Motherlode-style gold deposits with associated liswanite alteration in the **Atlin terrane**.
* Encouraging drill intersections of gold-silver-copper-lead-zinc massive sulphides from the **Tulsequah property** could lead to reopening of the old Tulsequah Chief mine.
* The 140-kilometre access road reached the **Golden Bear** deposit and on-site construction began for mine startup in late 1989.
* Development work started toward underground production from the **McDame asbestos deposit** by 1990.
* **Reg (Johnny Mountain) gold mine** in the Iskut River area began production in August.
* Development started on the adjacent **Snip gold deposit** with a target production date of late 1989.
* The **Stewart - Iskut River gold belt** was the busiest exploration area in British Columbia with more than fifty companies spending over $43 million.
* Exploration in the **Iskut River map area** over the last three years has more than **doubled** the number of known occurrences.
* **Regional Geochemical Survey release** of stream sediment samples for Iskut River, Telegraph Creek, Sumdum and Tulsequah sheets produced a staking rush and provides much needed data in this area of high mineral potential.
* **Silbak Premier and Big Missouri deposits** in the Stewart mining camp being prepared for production in April, 1989.
* **Lawyers property** in the Toodoggone scheduled to go into production early in 1989.
* An intense exploration program was completed on the **Fireweed** silver-lead-zinc mineralized zones west of Babine Lake.
* Reserves for the **Silver Queen mine** increased to more than 1.5 million tonnes containing silver, gold and zinc.

TRENDS

Several companies changed the focus of their exploration programs to properties with base metal potential. Typically these are deposits with a polymetallic signature involving at least one precious metal. Obvious targets of this type in northwestern British Columbia are volcanogenic massive sulphide deposits and copper-gold porphyry deposits. Cominco Ltd. completed the second year of major drilling programs on both the Tulsequah and Anyox volcanogenic massive sulphide deposits and Western Canadian Mining Corporation defined reserves on the Kerr porphyry copper-gold deposit. With internationally declining base metal reserves the opportunity exists for other companies to explore for base metals in anticipation of favourable metal prices in the 1990s.

The results of the last three years have proved that the precious metal potential of the Stewart mining camp extends north beyond the Iskut River. Further exploration will probably show that the gold belt can be traced to the northern limits of the Stikine terrane (Tulsequah-Tatsamenic Lake area). Grassroots exploration north of the Iskut River area should result in a number of new gold and gold-copper discoveries over the next few years.

Exploration for Motherlode-style auriferous quartz veins hosted by Cache Creek Group rocks continued in the Atlin area targeted on zones of listwanitic alteration associated with placer gold deposits. North of Atlin several new precious metal showings have been found in the Atlin terrane. These results should encourage others to explore for gold away from the known placers.

More grassroots exploration than in the last several years led directly to new finds, particularly in the region from Stewart to Tulsequah. Prospectors played an important role in many of these new discoveries. The current exploration boom has generated demand for their skills and properties.

The development of new mines, such as the Reg and Lawyers, in areas that rely either exclusively or heavily on air access is resulting in different economic impacts than for mines which rely entirely on road and rail transportation. Employees for these operations are being transported by air from a number of communities, including Vancouver. This disperses the mine employees among a number of communities and reduces the impact on any particular town.

Proposals for Recreation Corridors, Wilderness Areas and other designations which would affect access to Crown land for exploration have received much attention. One is the proposed Stikine Recreation Corridor which would extend along the Lower Stikine River from Glenora to the Alaska Panhandle. Another is the Dease River Recreation Corridor stretching from Lower Post to Dease Lake.

Research activity into gold deposits and their host rocks by the British Columbia Geological Survey, Geological Survey of Canada and various universities is producing important new ideas after approximately five years of concerted effort. The geological database for a number of areas in northwestern British Columbia has improved, particularly at the scale of 1:50 000. A more complete understanding of the nature and genesis of the gold deposits is assisting in the continuing search for more ore.

SUMMARY OF EXPLORATION ACTIVITIES

MINERALS

A total of 288 Notices of Work for mineral exploration were submitted in 1988 for the Northwestern District. These varied from small programs by individual prospectors to large exploration projects with expenditures exceeding $5 million. Exploration programs were also completed on some of the developed properties listed in the following section. A summary of the 99 major exploration properties with drilling, underground development or major surface exploration programs is presented in Table 1.

Tatshenshini River Area

Geddes Resources Ltd. continued its aggressive exploration program on the Windy Craggy orebody (1) in the extreme northwest part of the province. It spent $9.9 million to define the Gold zone and improve the definition of the ore reserves in the North and South massive sulphide zones. Initial drilling to intersect the Gold zone was disappointing, but four later holes cut the zone. One intersected 0.62 per cent copper, 4.5 grams gold and 3.4 grams silver per tonne over 18.6 metres. A crosscut through the South zone confirmed drill intersections and included a fine-grained pyrite section which contained more than 2 per cent copper and 0.1 per cent cobalt. Reserves for the massive sulphide bodies are in excess of 100 million tons of 2 to 3 per cent copper with 0.1 per cent cobalt. A special submission to the government outlined a proposed route for a road necessary to develop this project.

To the northeast, on Squaw Creek (2) near the Yukon border, Arbor Resources Inc. drilled through placer gravels to test a shear zone for the source of the placer gold.

Atlin Region

Northwest of Atlin in the Tutshi Lake area, United Keno Hill Mines Ltd. and Noranda Exploration Company, Limited drilled gold targets on the Mill (3) and Moon Lake (4) properties. Both properties are along the trace of the Llewellyn fault a long-lived structure element paralleled by a belt of stream sediments containing anomalous amounts of gold and arsenic.

In the immediate Atlin area, several companies searched for Motherlode-style gold deposits hosted by Cache Creek Group rocks and associated ultramafic bodies, however, Homestake Mineral Development

Company completed the only major projects; it drilled the Pictou (5), Heart of Gold (6) and Yellowjacket (7) properties. These drill holes are providing important geological information in an area characterized by limited outcrop. The British Columbia Geological Survey Branch started a 1:50 000-scale mapping program in 1988 to further advance our understanding of the geology in the Atlin area.

Tulsequah River - Tatsamenie Lake Area

Cominco Ltd. continued to explore near the Tulsequah Chief mine (9) in the Tulsequah River area tracing Kuroko-type volcanogenic massive sulphide horizons hosted by Triassic Stuhinni Group felsic volcanic rocks. All 1988 drill holes intersected one of the mineralized horizons. Drill hole 1998-3 intersected 17.5 metres grading 3.0 grams gold and 62.7 grams silver per tonne and 4.60 per cent copper, 0.25 per cent lead and 3.09 per cent zinc more than 200 metres down plunge from the lowest mine level (see Table 3 for reserves). On the other side of the Tulsequah River, Suntac Minerals Corpation drilled several vein systems at the old Polaris-Taku mine (10) and intersected encouraging gold values, including 19.5 grams gold per tonne over 3.1 metres.

To the east, in the Tatsamenie Lake area, the Golden Bear road reached the future mine site (*see* Development Projects, 11) providing access to this remote area. Dia Met Minerals Ltd. (12) drilled a gold target located approximately 5 kilometres south of the Golden Bear deposit.

TABLE 3
ADVANCED EXPLORATION PROJECTS IN NORTHWESTERN B.C.

PROPERTY	COMPANY	RESERVES
1. Windy Craggy	Geddes Resources Ltd.	100 Mt @ 2% Cu, 4 g/t Au, 0.1% Co
2. Tulsequah	Redfern Resources Ltd./ Cominco Ltd.	2.16 Mt @ 2.03% Cu, 1.25% Pb, 6.28 % Zn, 2.57 g/t Au, 91.9 g/t Ag
3. Sulphurets	Newhawk Gold Mines Ltd./ Granduc Mines Ltd.	1.4 Mt @ 17.4 g/t Au, 206 g/t Ag
4. Mount Klappan	Gulf Canada Corporation	1000 Mt anthracite
5. Al	Energex Minerals Ltd.	330 kt @ 10 g/t Au
6. Baker Mine	Multinational Resources Inc.	45 kt @ 20.1 g/t Au, 176 g/t Ag, 0.75% Cu
7. Mets	Golden Rule Resources Ltd./ Manson Creek Resources Ltd.	160 kt @ 11.3 g/t Au
8. Dome Mountain	Teeshin Resources Ltd./ Canadian United Minerals Inc./ Total Energold Corporation	290 kt @ 12.7 g/t Au, 68.4 g/t Ag
9. Telkwa	Crows Nest Resources Limited	50 Mt bituminous coal
10.Silver Queen	Houston Metals Corporation	1.72 Mt @ 328 g/t Ag, 2.7 g/t Au, 6.19 % Zn

CASSIAR MINING CAMP

Diminishing ore reserves at the two operating gold mines in the Cassiar mining camp provided ample incentive for exploration at the two properties in 1988. Total Energold Corp. explored extensively on its claims surrounding the Erickson Gold mine (16) with drilling in the Main mine, Catherine, Vollaug, Beaton Creek and Finlayson adit areas. Drilling was completed for extensions of productive veins in the Main mine area, testing veins with no previous production and exploring for vertical veins beneath the Vollaug vein. In the Michelle zone 22 680 tonnes grading 34.3 grams gold per tonne were defined beneath the Cusac mine (17). Taurus Resources Ltd. explored in the Hopeful area (14) and completed mill tests on a bulk sample. The Erickson Gold, Taurus and Cassiar asbestos mines are discussed below.

A new map of the Cassiar area at 1:50 000 scale will be published by the British Columbia Geological Survey Branch in early 1989 which will provide a much needed updated geological database. Thesis research by M. Ball of Queen's University has identified two types of mineralized veins. Lower gold values are contained in older tetrahedrite-pyrite veins and higher grade gold occurs in deformed, gray quartz veins with associated sulphides.

North of Cassiar near the Yukon border at the Albert Creek property Total Energold Corp. (13) drilled the contact between the Upper Devonian McDame Group carbonates and Upper Devonian-Lower Missippian transgressive black clastic rocks of the Lower Sylvester Group for manto mineralization. Results were disappointing although anomalous silver associated with fracture- controlled sulphides and weak zinc or barite mineralization was found in clastic sediments.

Stikine Area

Numerous claims were staked along the Stikine River and to the east as far as Mount Edziza park. The interest in the area developed from recent discoveries in the Iskut River area to the south coupled with known porphyry copper-gold occurrences at Galore Creek and Schaft Creek. Although more than ten companies explored in the area, the only drilling was completed on Continental Gold Corp.'s Trophy Gold (20) project

near the headwaters of the Skud River. The best assays on this property came from the Ptarmigan zone, including an 11.1 metre intersection
which contained 5.5 grams gold and 30.2 grams silver per tonne. The zone consists of a breccia with associated silicification and a sulphide-rich matrix containing pyrite, sphalerite, galena, arsenopyrite, native gold and electrum. Surface exploration by Continental Gold discovered numerous chalcopyrite-magnetite skarns. Future exploration in this area is expected to find more skarn, replacement and porphyry deposits with associated copper and gold values. Two maps at 1:50 000 scale by the British Columbia Geological Survey Branch covering the Galore Creek and Scud River areas will be released in early 1989.

East of Mount Edziza drilling was completed on the Teck Explorations Ltd. Castle (18) and Bee Jay (19) properties to test gold mineralization in a structurally-controlled pyritic alteration zone and quartz sulphide veins, respectively.

In August the Regional Geochemical Survey results were released for the Iskut River, Telegraph Creek, Sumdum and Tulsequah map sheets. Numerous gold anomalies from these stream sediment samples attracted immediate attention and generated a staking rush.

Iskut River Area

The Iskut River area was explored by more than 30 companies spending in excess of $15 million. Drill programs were completed by sixteen companies (see Table 1; 22-37). Exploration was typically focused on gold in veins and shears with associated quartz, carbonate, sulphides or chlorite and hosted by Triassic Stuhinni or Jurassic Hazelton Group volcanics and sediments.

Alteration zones with widely spread anomalous gold, copper and sometimes molybdenum values were also tested by Skyline Explorations Ltd., Keewatin Engineering Inc. and Meridor Resources Ltd. for high-grade gold zones. Initial results suggest these zones are weakly mineralized, porphyry-style deposits with limited potential for high-grade mineralization. Replacement mineralization is being investigated by several companies following the success of Gulf International Minerals Ltd. on the McLymont Creek property. Drilling intersected intense silicification in a Permian crinoidal limestone with patchy pyrite, magnetite, specular hematite, barite, chalcopyrite, sphalerite and galena. Mineralization over widths of metres to tens of metres has been identified. One of the better intersections averaged 0.36 per cent copper, 22.6 grams silver and 13.8 grams gold per tonne over a width of 5.2 metres.

Approximately 40 kilometres to the southeast, Echo Bay Mines Ltd. drilled the Q17 vein on the Doc property (49). Hosted by Mesozoic sedimentray rocks, the mineralization is similar to that found in the Iskut River area. Current reserves on the Q-17 and six other veins are 425 890 tonnes grading 9.26 grams gold and 44.9 grams silver per tonne.

The Geological Survey of Canada is currently mapping the Iskut River 1:250 000 sheet to provide a much needed updated regional map.

Sulphurets Area

Silver-gold deposits hosted by volcanic and sedimentary rocks of the Jurassic Hazelton Group were the target for exploration companies in the Sulphurets and Stewart areas. Typically these deposits are quartz veins and siliceous breccias containing tetrahedrite, pyrargyrite, proustite and electrum.

In the Sulphurets area Newhawk Gold Mines Ltd. continued its exploration on the Sulphurets property (42) with extensive drilling and underground drifting on the West zone. Results included a spectacular intersection in the new U.T.C. zone of 408 grams gold and 1570 grams silver per tonne over 9.1 metres. (see Table 3 for reserves). Immediately west of the Sulphurets property, Western Canadian Mining Corp. (39) drilled a porphyry copper-gold prospect and estimated reserves of 60 million tonnes of 0.84 per cent copper, 0.34 grams gold and 2.05 grams silver per tonne. Catear Resources Ltd. and related companies drilled the Mount Madge (40) properties in the area.

To the north, near Tom McKay Lake, Calpine Resources Ltd. (38) discovered the new #21 gold zone, an alteration zone roughly conforming to a contact between felsic volcanic breccias and clastic sediments. The high-grade mineralization occurs with massive realgar, stibnite and orpiment. Other sulphides including sphalerite and galena occur as disseminations and lenses within the alteration zone. Hole CA88-6 intersected 29.1 metres of 25.0 grams gold and 37.7 grams silver per tonne.

Current geological mapping at 1:50 000 scale by the British Columbia Geological Survey Branch is providing a very necessary database for exploration companies working in the area. Research results from his work in the Stewart area has shown that many of the gold deposits can be related to one epoch of mineralization of Jurassic age. Several researchers from the Geological Survey of Canada, including Bruce Ballantyne and Rod Kirkham are working on geochemical and ore deposit research in the Sulphurets area.

Stewart Mining Camp

In the Stewart Mining camp Westmin Resources announced production plans for its Silbak Premier (48) and Big Missouri (45) deposits (see Development Projects). Exploration included underground geological mapping and drilling at Silbak Premier and surface drilling on the High Ore (Woodbine) (47) property and Big Missouri deposit. Esso Minerals Canada carried out major exploration programs on the Silver Butte (44) and Indian (46) veins. Esso Minerals followed surface intersections on the high sulphide Facecut-35 zone with

underground drilling and completed extensive drilling on the new low sulphide Kansas zone intersected in only one hole in 1987.

Northeast of Stewart several companies explored the Knip (50), Todd Creek (51), AM (52) and Joutel (53) for deposits similar to the high-grade mineralization mined at Silbak Premier. Immediately north of Stewart the Dunwell mine (54) was rehabilitated and diamond drilling indicated there is depth potential for the quartz-sulphide vein. On the nearby Glacier Creek property (55), Morocco Explorations Inc. drilled three holes.

A recent University of British Columbia Master's thesis by D. Brown on the Silbak Premier property and surrounding area is an extremely useful reference for the Stewart area.

Portland Canal Area

Favourable Hazelton Group lithologies extend southward from Stewart into the Portland Canal area, although the deposits are typically silver-lead-zinc veins or conformable sulphide horizons. At the Georgia River property (56) Avatar Resource Corporation drilled the northerly-trending main vein to test the precious metal mineralization with associated base metal values.

Cominco Ltd. continued its exploration program on the Anyox property (57) with drilling in the Bonanza and Hidden Creek areas targeted on volcanogenic massive sulphides near the sediment- volcanic contact. Hidden Creek produced 24 million tonnes grading 1.5 per cent copper, 0.17 gram gold and 10.3 grams silver per tonne. Immediately to the east Pacific Geo-Rock Exploration Ltd (58) completed surface exploration and drilling on quartz veins which were mined for flux for the Anyox smelter.

In the Alice Arm area, Richmark Resources Ltd. explored the Tidewater property (59), a molybdenite occurrence. All 1979 and 1980 drill-core pulps were re-assayed which revealed geochemically anomalous gold values. The subsequent drilling program intersected polymetallic mineralization at depth.

At the north end of the Kitsault valley, Cominco Ltd. (60) continued to explore for silver along a shear zone with sparse sphalerite and pyrite mineralization.

Prince Rupert Region

A high proportion of the companies exploring in the Prince Rupert region carried out major programs. On Dunira Island (61) several holes were drilled by Orequest Consultants Ltd. to test for massive sulphide potential. The area lies within the Alexander terrane which hosts the Windy Craggy and Greens Creek volcanogenic massive sulphide deposits.

Immediately south of Prince Rupert on Porcher Island, Cathedral Gold Corporation completed an extensive drilling program on the old Surf Point and Edye Pass mines (62) increasing the known reserves to 565 173 tonnes grading 6.85 grams gold per tonne. The mineralization is auriferous pyrite in quartz veins and shears hosted by a quartz diorite stock. On Princess Royal Island another past gold producer, the Surf Inlet mine (64), was also attracting attention with underground rehabilitation and drilling by Surf Inlet Mines Ltd.

On Banks Island, Hillsborough Resources Limited (63) drilled one hole on the Kim low-grade gold zone and another on the Discovery zone high-grade gold skarn. On the south side of the Khutze River Freemont Gold Corporation (65) drilled a quartz vein containing gold in pyrite and chalcopyrite.

Terrace-Kitimat Area

In the Terrace area Terracamp Developments Ltd. (66), Univex Mining Corporation (68) and Castello Resources Ltd. (67) examined gold occurrences with old underground workings. The mineralization is typically quartz veins with associated sulphides.

Toodoggone River Area

In the Toodoggone River area the mineral deposits are porphyry deposits, skarns and mesothermal to epithermal veins. Initial exploration in the area was directed towards the porphyry deposits; however, during the past ten years numerous gold-silver epithermal veins have been identified. The veins are hosted by Triassic Takla Group and Early Jurassic Toodoggone volcanics which are equivalent to the Hazelton Group. J.Clarke of McGill University has recently shown that the veins are restricted to the first stage of volcanism in the Toodoggone volcanics and therefore exploration can be targeted at the stratigraphy at or below this level. Major northwest-trending faults appear to be important in localizing the mineralization. Although overall activity levels in the Toodoggone were down from 1986 and 1987, total exploration expenditures exceeded $6 million with more than 25 companies working in the general area. Cheni Gold Mines Inc. continued preproduction work with plans for startup in early 1989.

In the northern part of the Toodoggone area, Energex Minerals Ltd. continued work on the Al property (69) with drilling on the BV, Bonanaza, Ridge, Bingo and Thesis II zones to increase reserves (see Table 3) and to search for extensions of known zones. For the first time since Kidd Creek's work in 1984, Energex Minerals Ltd. explored the JD property (70) carrying out a major trenching program to test a low-angle fault with associated gold mineralization. Manson Creek Resources Ltd. drilled seven holes on the Mets property (71) to increase the ore reserves established in 1987 (see Table 3). Cyprus Metals (Canada) Ltd. continued drilling on the Moosehorn property (72) testing two zones on either side of the Toodoggone River near Moosehorn Creek.

South of the Toodoggone River, Sutton Resources Ltd. (73) drilled the Main Zone to test it at depth and along strike. Encouraging values were intersected including 5.05 grams gold per tonne over 10.7 metres in hole

#25. Bond Gold Canada drilled several zones on its Silver Pond property (74). On the Chapelle property (76) the New and North Quartz zones and A, B and C veins were drilled by Multinational Resources Inc. Minor new reserves (less than 10 000 tonnes) were identified from the A vein. Esso Minerals Canada tested five zones on the Shasta property (77) including the JM and Creek zones. The most continuous mineralization occurs as quartz veins and stockworks with electrum, argentite, pyrite and traces of sphalerite, galena and chalcopyrite. Small calcite veins were found to have high gold and silver values as well. On the Brenda property (78) both the Takla and Creek zones were tested with encouraging mineralization encountered on the latter.

South of the Finlay River and east of Thutade Lake, Hermes Ventures Ltd. (79), St. Phillips Resources Inc. (80) and El Condor Resources Ltd. (81) explored in Takla volcanics for skarn and porphyry deposits. On the Kemess Creek property, St. Phillips Resources Inc. intersected 73 metres grading 0.486 gram per tonne gold and 0.20 per cent copper.

Smithers-Houston Area

Silver-rich veins, replacement mineralization and deposits transitional to porphyry deposits (for example, Equity Silver) were the principal exploration targets in the Smithers-Houston area. Base metal and gold values associated with the silver make these polymetallic occurrences attractive. Major exploration programs on these deposits were completed on the Knoll (83), Max (84), Rocher DéBoulé (85), Fireweed (86), Cronin (87), Victory (88), Bob Creek (91), Silver Queen (92), Equity Silver minesite (93) and Gaul (90) properties.

The Canadian United Minerals Inc. Fireweed property generated considerable interest with the definition of the West and East mineralized zones hosted by Skeena Group argillites and sandstones. The mineralization occurs as disseminations of galena and tetrahedrite(?) in sandstones and as massive sulphide veinlets and conformable layered bands containing pyrite, pyrrhotite and chalcopyrite. Drill intersections of the mineralized sandstones return intercepts such as 13 metres grading 607 grams silver per tonne, 1.8 per cent lead and 3.1 per cent zinc from hole 88-22.

Near Owen Lake, Houston Metals Corporation continued its major exploration program on multiple silver-lead-zinc-gold veins hosted by Cretaceous Tip Top Hill volcanics. Expenditures were in excess of $3 million. Underground development focused on accessing the southeastern end of the #3 vein with a decline and driving the Bulkley crosscut towards the Cole Lake area. Drilling was completed on several veins with the majority of holes testing the #3 vein; less than ten holes were drilled on the Camp and George Lake zones. A feasibility study was completed by Cominco Engineering Services Ltd. in October which recommended more metallurgical studies and the definition of more high grade gold-silver ore on the No. 3 vein before production could be considered.

On Dome Moutain (89) Teeshin Resources Ltd. drilled on the the Cabin vein and Elk showing searching for additional ore reserves (see Table 3). Legal ownership of the Dome Mountain property continued to be clouded by disputes between Teeshin Resources Ltd., Canadian United Minerals Inc. and Total Energold Corporation. Southern Gold Resources Ltd. (85) rehabilitated the Rocher Déboulé underground workings and drilled 14 holes to test for gold mineralization.

Geological mapping of the Smithers area at 1:50 000-scale was extended to Hudson Bay Mountain and the Telkwa Range by the British Columbia Geological Survey Branch. This mapping program covered the Dome Mountain and Cronin mine areas in previous summers. The mapping is highlighting the volcanic stratigraphy ofin the area which correlates with the various types of mineralization.

Tathsa Lake-Ootsa Lake Area

On Sibola Mountain (94) Teeshin Resources drilled the East and West zones intersecting pyrite and sphalerite as stringers and thin lenses in the latter. The mineralization appears to be related to the nearby Whiting Creek porphyry copper-molybdenum deposit. Southeast of Kemano, Fleck Resources Ltd. drilled a major vein and established reserves of 20 130 tonnes grading 10.4 grams gold per tonne over a 2.2 metre mining width.

Virtually all exploration in the Ootsa Lake area was directed toward finding epithermal precious metal deposits hosted by Eocene Ootsa Lake Group volcanic rocks. Typically the mineralization occurs as large areas of silicification with associated values in silver and gold. Drill programs on these targets were completed by Chalice Mining Inc. (95) and Mingold Resources Inc. (97). Further to the southeast Lac Minerals Ltd. (98) drilled a pyritic zone in Hazelton Group volcanic rocks identified by anomalous stream-sediment analyses.

Geological mapping by for the British Columbia Geological Survey Branch has identified several areas of potential epithermal mineralization in the Whitesail Lake area. They also determined a local stratigraphy and age for the Ootsa Lake Group volcanic rocks.

COAL

Four Notices of Work were filed on coal properties in the Omineca Mining Division. On its Klappan property (99) in the Bowser Basin south of [illegible]se Lake, Gulf Canada Resources Inc. completed diamond drilling in the area of the proposed open-pit. In the Hazelton area Atna Resources Ltd. (100) drilled three holes to test bituminous coal seams in Skeena Group sediments. After several years with no exploration, Crows Nest Resources Ltd. (101) drilled fourteen holes on the north side of the Telkwa River in an attempt to increase coal reserves (see Table 3).

PLACER

The most active placer area in northwestern British Columbia was the Atlin area with mining activity focused on Pine, Otter and Spruce Creeks. A large operation by Queenstake Resources Ltd. on Pine Creek is estimated to have produced 429 000 grams gold. A total of 52 placer Notices of Work, exactly the same amount as 1987, were filed for the Atlin Mining Division, including three located on Squaw Creek near the Yukon border.

In the Liard Mining Division 39 Notices of Work were submitted, a decline of 20 per cent from 1987. McDame, Dease and Rosella creeks and the Barrington River were the most active areas. Integrated Resources Ltd. conducted a large placer operation on the Barrington River. Three and five Notices of Work were filed in the Omineca and Skeena mining divisions respectively.
Neither division had any placer mining activity in 1987.

DEVELOPMENT PROJECTS

Development work continued on the Golden Bear (11) gold deposit located approximately 140 kilometres west of Dease lake. The property is now owned by the Golden Bear Operating Company, a subsidiary of Homestake Mineral Development Company and Chevron Canada Resources Ltd. A gravel road was constructed to provide access to the minesite. On-site construction included building a permanent camp, upgrading both the airstrip and roads on the property and starting foundations for the plant. Current plans are for the mine to be in production in late 1989 at a milling rate of 350 tonnes per day.

TABLE 4
DEVELOPMENT STAGE PROJECTS IN NORTHWESTERN B.C.

PROPERTY	COMPANY	ORE RESERVES
1. McDame	Cassiar Mining Corporation	16 Mt @ 5.6% asbestos fibre
2. Golden Bear Corporation/	Chevron Minerals Ltd./ Homestake Mining (B.C.) Ltd.	1.63 Mt @ 11.0 g/t Au North American Metals
3. Snip	Cominco Ltd./ Delaware Resources Corporation	1.43 Mt @ 21.9 g/t Au
4. Gold Wedge	Catear Resources Ltd.	270 kt @ 28.7 g/t Au, 29.5 g/t Ag
5. Big Missouri	Westmin Resources Ltd./ Canacord Resources Inc./ Tournigan Mining Exploration Ltd.	1.58 Mt @ 3.6 g/t Au, 80.2 g/t Ag
6. Silbak	Premier Westmin Resources Limited/ British Silbak Premier Mines Ltd./ Canacord Resources Inc.	5.87 Mt @ 2.2 g/t Au, 80.3 g/t Ag
7. Lawyers	Cheni Gold Mines Inc.	1.94 Mt @ 6.72 g/t Au, 243 g/t Ag

With the announcement of a production decision for the McDame asbestos deposit in 1988, Cassiar Mining Corporation moved to assure their supply of asbestos for at least the next ten years. Development work consisted of slashing on the two levels, starting a decline for a conveyor system and laying a pipeline to the portal.

In conjunction with a major exploration program, Cominco Ltd. started development work aimed at putting the Snip deposit in the Iskut River area into production in late 1989. The airstrip was upgraded to handle Hercules and DC-6 aircraft and modifications were made to the camp. Cominco submitted its Stage 1 report in August 1988. The mine is to be supplied by aircraft flying from various points including Smithers, Wrangell, and Vancouver. Underground development has confirmed surface drill intersections and current reserves now exceed 1.4 million tonnes with 25 per cent dilution (see Table 4).

In the Sulphurets area Catear Resources Ltd. completed a drilling program on the Gold Wedge fractional claim group (41) testing the Golden Rocket, Discovery and Goldridge veins to increase reserves (see Table 4). A decline with associated underground development was completed on the Golden Rocket vein. A 50 ton per day mill was constructed and in 1988 it was in the final stage of commissioning with low-grade ore being processed prior to milling the high-grade stockpile. Plans are to upgrade the mill in 1989 to 225 tonnes per day.

Westmin Resources Limited announced a production decision for the Big Missouri (45) and Silbak Premier (48) silver-gold deposits located north of Stewart. The mill is currently under construction with the creek diversion, tailings pond, transmission line and Big Missouri access road completed. Initial stripping for the Silbak Premier and Dago open-pits has started. The Big Missouri mining operation will be seasonal with stockpiling of ore because of the high snowfall. Initial production is planned for April 1989.

The Lawyers gold-silver deposit (75) of Cheni Gold Mines Inc. in the Toodoggone River area will be in production in early 1989. Initial production will be from the AGB zone with later development of the Cliff Creek and Duke's Ridge zones. The tailings pond, camp, haulage level and initial stope development have been

completed. The mill was virtually complete by the middle of December and ore was mined and stockplied for the last three months of 1988. The mill will process 500 tonnes per day.

6. Operating Mines

Six mines operated in the Northwestern District in 1988 (Table 2). They employed more than 1000 people and continued to play an important economic role in the region. Generally higher commodity prices for base metals and a more stable demand for asbestos fibre resulted in positive profit margins for the open- pit mines. Gold prices were down from 1987, but remained at economic levels for the underground gold mines.

Cassiar Mining Corporation maintained its production levels at approximately 100 000 tonnes of ore per month from its open-pit operation with no shutdown during the summer months. The waste-to-ore ratio decreased throughout the year as the bottom of the pit was approached. At the end of the year very little waste was being mined and some ore was being stockpiled. Slope stability has became a problem with the development of major fractures on the east and south walls, and the open pit operation will be completed by April 1989; stockpiled ore will keep the mill supplied until 1990. when the underground McDame deposit will begin production.

Total Energold Corporation continued to produce at approximately 250 tons per day from its Erickson Gold mine until the end of November when all accessible ore reserves were mined out. Total Energold is currently driving an adit to access the Michelle zone beneath the Cusac mine. The mill is expected to reopen in 1990. The other gold mine in the Cassiar Camp, Taurus, processed a large bulk sample from the Hopeful zone. It also closed down its mill in December, 1988, pending assessment of possible sources of more ore.

The first major new mine in the Northwestern District in seven years, the Reg (Johnny Mountain), opened in August 1988. A gold mine located south of the Iskut River and accessible only by air, it is currently producing 180 tonnes per day. In 1998 the mill processed 24 250 tonnes of ore and produced 339 216 grams of gold, 662 695 grams of silver and 99 810 kilograms of copper.

On Babine Lake the Bell open-pit mine continued to produce 15 000 tonnes of ore per day at an average grade of 0.50 per cent copper with a waste to ore ratio of 0.85:1. The mill operated at 14 760 tonnes per day and produced 22 625 tonnes of copper, 874 kilograms of gold and 3 171 kilograms of silver.

The Equity Silver open-pit mine south of Houston operated at a mining rate of 30 000 tonnes per day with a waste-to-ore ratio of 3.03:1. The mill processed 8500 to 9000 tonnes per day and produced an estimated 181 000 kilograms of silver, 14 140 kilograms of gold and 6 358 tonnes of copper in the concentrate and 2 157 kilograms of gold in dore bars.

Exploration Opportunities

- Numerous areas in the Northwestern District with excellent mineral potential are still open for staking. Some of the best exploration opportunities are:
- Polymetallic volcanogenic massive sulphide deposits in the Tatshenshini River, Cry Lake and Prince Rupert areas.
- Copper-gold porphyry deposits in the Stikine terrane, such as the Galore Creek and Bell Copper deposits.
- Mesothermal gold veins and skarns associated with major faults on the coastal islands south of Prince Rupert.
- Epithermal precious metal deposits with associated silicification, hosted by Eocene volcanics in the Ootsa-Francois Lake area.
- Silver-lead-zinc manto deposits, similar to the Mount Hundere deposit in the Yukon, hosted by Devonian carbonates in the Cassiar thrust and fold belt.
- Motherlode-style gold deposits in the Atlin terrane away from Atlin.

CENTRAL DISTRICT

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INTRODUCTION

Mineral exploration in the Central District in 1988, as measured by Notices of Work filed, matched the record pace set in 1987. Expenditures however, were up an estimated 10 to 15 per cent, due to the number of large-budget programs this year. Late mobilizations, follow-up programs and winter drilling were a feature of the year, with at least eight drills in the field at the end of November.

Precious metals, in all forms of deposit, once again dominated exploration targets. Despite improved prices and a better long-term outlook, there was little interest in base metals, and interest in industrial minerals was also low. As in 1987, coal exploration was largely confined to the vicinity of existing operations.

HIGHLIGHTS

* An aggressive exploration and development program at Blackdome gold mine.
* Promising results were obtained by Imperial Metals Corporation in outlining higher grade open-pittable zones at the Cariboo Bell copper-gold deposit.
* Mosquito Consolidated Gold Mines Limited began a $7.5 million program to explore the old Island Mountain and Cariboo Gold Quartz mine workings.
* Mineable grades and tonnages were outlined at the Phil-Heidi (Mount Milligan) copper-gold deposit by Continental Gold Corporation and United Lincoln Resources Ltd.
* A prospectus was filed for the QR gold deposit, with production scheduled for 1990.

TRENDS AND OPPORTUNITIES

Many companies, juniors especially, experienced difficulty raising funds for exploration projects this year. This in turn resulted in several delayed or cancelled projects. This trend is expected to persist in 1989. The shift in exploration interest from the Cariboo to the Omineca continues. The attraction of the Omineca lies in the rapidly improving access as logging in the area intensifies, coupled with some promising results from properties such as the Phil-Heidi, Takla-Rainbow and Tas.

Major opportunities exist in the northern Quesnel trough for the discovery of alkali-porphyry-related copper-gold deposits. As in the southern part of the trough, the target intrusives appear to have good magnetic signatures, with spatially related placer gold mineralization or gold geochemical anomalies in soils. Unlike the southern part of the trough, where the most promising discoveries to date have been limited to a strong linear trend on its western margin (for example QR, Cariboo Bell), targets in the northern Quesnel trough appear to be more scattered (for example Chuchi, Phil-Heidi, Takla-Rainbow, Windy).

Another developing target area is in Cache Creek Group or Takla Group rocks along the Pinchi fault system. Precious metal mineralization has been found in quartz-sulphide veins or shear zones, commonly associated with listwanitic alteration. Targets are usually characterized by high-contrast geochemical anomalies.

In placer mining, where the scope for traditional small-scale operations continues to be very limited, there is a trend toward larger, more innovative and better-financed projects, targeted on interglacial and pre-glacial deposits or buried channels.

SUMMARY OF EXPLORATION ACTIVITY

A total of 161 mineral Notices of Work were received to the end of November - the same as in 1987. The number of drilling or underground exploration projects, at 61, was also close to the 1987 figure. Placer Notices of Work, at 456, were up 8 per cent from 1987. Table 1 gives some details of selected major exploration programs in the district, with the locations shown on Figure 2. Table 2 gives details of the five operating mines in the district.

MINERALS

Quesnel Trough

Exploration in the Quesnel trough continued at a high level, mostly on established properties. Targets were precious metals in volcanogenic massive sulphides, alkali porphyry and porphyry-related deposits, and basal phyllite-hosted gold deposits.

Placer Dome Inc. completed 18 980 metres of drilling at the QR alkali-phorphyry-related gold deposit (105), for reserve definition, ore grade calculation and mine planning purposes. Baseline environmental studies were also completed and a Prospectus filed with the Mine Development Steering Committee. Production is scheduled to start in 1990 at a rate of 5400 tonnes per day, and the mine is expected to employ 70 people. Mining will start by open pit on the Main zone, with West and Midwest zones to be mined later by decline or adit from the Main zone pit. Placer Dome also drilled two other alkali-porphyry targets near the QR deposit, including 3660 metres on the Maud (106) and 730 metres on the Kwun (110), with largely disappointing results.

Imperial Metals Corporation has completed 41 holes on the Cariboo Bell alkali-porphyry deposit (107) with more drilling in progress. Seven areas of high gold values in the intrusive were tested, with the objective being to outline a zone or zones containing a few million tonnes of open-pittable ore. The elevated gold values occur with chalcopyrite in skarn-like zones of magnetite and potash feldspar alteration that appear to be structurally controlled. Results to date are encouraging. Imperial Metals also completed a modest drilling program on the Jamboree property (113), another porphyry target.

Gabriel Resources Inc. completed a major program of drilling, trenching, geochemistry and geophysics on the G South property (117), begun in 1987. Gold occurs with massive sulphides in steeply dipping veins in a block-faulted pattern in andesite porphyry flows. No major additions to the known reserves of 45 000 tonnes grading 9.3 grams per tonne gold were made however.

Noranda Exploration Company, Limited, completed 700 metres of drilling, with more planned, at the Hixon Creek property (120) where gold-bearing quartz-sulphide veins were explored on several underground levels in the 1930's.

In the southern part of the Quesnel trough, GWR Resources Ltd. drilled four holes on the Miracle property (130), a gold-bearing sulphide vein in andesitic volcanics. Results were encouraging and a follow-up drilling program is planned.

Basal Phyllite-Hosted Gold

Exploration of several properties in the basal phyllites of the Quesnel trough took place again this year. Drilling and underground exploration continued at the Frasergold property (114), despite a legal dispute between the joint-venture partners, Eureka Resources Inc., Sirius Resources Ltd., and Southlands Mining Corporation. A total of 183 metres of adit and crosscuts were completed on the main Jay zone, as well as over 2700 metres of percussion and diamond drilling. The underground work showed a good visual correlation between the higher grade hanging wall of the Jay zone and the amount of secondary quartz structures developed in the phyllites. This correlation may be of value to others exploring basal phyllite targets.

On the CPW property (108), Pundata Gold Corporation completed a major program of rotary and diamond drilling, trenching and metallurgical tests begun in 1987. Other phyllite targets tested by drilling were the Nov (104) by Malcolm Resources Ltd., and the Forks (111) and Tep (112) properties by Armada Gold and Minerals Ltd. As with most phyllite-hosted properties tested to date, results were mixed to occasionally good, with Armada, for example, reporting a 2-metre intercept assaying 30.8 grams per tonne gold from a trench on the Forks property.

Barkerville - Cariboo Mountains

Mosquito Consolidated Gold Mines Limited began a major program of underground exploration at the adjacent Island Mountain and Cariboo Gold Quartz mines (122). The principal objective is to test the Main Band limestone for replacement gold-pyrite mineralization. The Main Band limestone hosts all the ore found to date at the Mosquito Creek Mine but was virtually untested at the other two mines.

Wells Gold Ltd. also explored for sulphide replacement mineralization in limestone with a drilling and trenching program at its Mount Tom and Whipsaw properties (123) near Wells, with some gold-bearing pyrite mineralization located. Also drilling for gold in vein targets in the Barkerville terrain were Gibraltar Mines Ltd. at the Duck property (103), where a base metal quartz vein system contains significant precious metals, and Rise Resources Inc. at Antler Creek (109).

Noranda Exploration drilled 900 metres in 12 holes on coincident geochemical and geophysical anomalies at Indian Lake (124). Near Eaglet Lake, Castello Resources Ltd. drilled the Com property (24), a polymetallic sulphide target in Slide Mountain Group andesites near the contact with a Tertiary granite stock, with disappointing results.

Omineca

Exploration for gold mineralization associated with alkali-porphyry and porphyry intrusions continues to highlight results from the Omineca. The United Lincoln Resources Limited - BP Resources Canada Ltd. joint venture continued a major drilling program on the Phil-Heidi property (134) on the flanks of the Mount Milligan stock. The stock is a multi-phased alkali porphyry intruding by a series of augite porphyry flows and tuffs. Gold occurs with disseminated chalcopyrite and iron sulphides in several zones of potassic alteration in the flows. The most promising of these zones, the MBX, has a drill-indicated potential of over 20 million tonnes with grades in the range 0.7 to 1.4 grams per tonne gold and 0.3 to 0.5 per cent copper. Two examples of the better intersections recovered are 85 metres of 0.86 gram per tonne gold and 0.6 per cent copper, and 76 metres of 2.16 grams per tonne gold and 0.5 per cent copper.

Cathedral Gold Corporation completed 39 holes totalling 7625 metres on the Takla-Rainbow property (135). Gold occurs with quartz and minor sulphides in several steeply dipping shear zones in highly altered andesites that have been intruded by an alkali-porphyry border phase of the Hogem batholith. Good gold values were obtained in most holes, and the continuity of the mineralization, which is poor near the intrusion, appears to improve in the South zone, away from the batholith.

The Noranda Exploration - Black Swan Gold Mines Ltd. joint venture reported mixed to good results from drilling in progress on the large Tas property (132), where gold occurs with pyrite, pyrrhotite and minor chalcopyrite in several zones in augite porphyry flows adjacent to a granodiorite porphyry stock. Most of the results reported to date were from drilling on the Ridge zone, with intersections ranging from 0.4 metres to 3.2 metres and grades ranging from 4.1 to 25.7 grams per tonne gold.

Eastfield Resources Ltd. completed a major program of drilling, trenching and soil geochemistry at the Indata property (136). Gold occurs with quartz, pyrite, arsenopyrite and other sulphides in shear zones, associated with quartz-carbonate alteration. The host rocks are andesites, minor diorite porphyry intrusions and serpentinites in a thrust slice of the Pinchi fault system. Gold mineralization was shown to occur over a strike length exceeding 1.5 kilometres. Typical intersections ranged from 0.5 metres to 1.8 metres with grades from 1.0 to 6.8 grams per tonne gold. One intersection of 6.1 metres grading 31.5 grams per tonne gold was also reported.

Several other companies were active in the Omineca, either through joint-venture interests or with early stage programs, including Chevron Canada Resources Ltd., Ezekiel Explorations Ltd., Kookaburra Gold Corporation Ltd., Lornex Mining Corporation Ltd., and Placer Dome Inc.

Fraser Plateau

There was a modest level of exploration on the Fraser Plateau this year. Targets were epithermal gold mineralization in silicified breccia zones in the plateau basalts, possibly related to volcanic vents, or in fault zones in basement inliers. Although several target areas have been identified and tested, grades reported to date have generally been subeconomic. The potential exists, however, for large tonnage, low-grade heap-leachable deposits.

Lac Minerals Ltd. continued exploration of its Bob property (115) with a program of rotary drilling in the upper oxidized zone of the host quartzites. Lornex Mining Corporation Ltd. completed 10 holes and some trenches on the Oboy property (116), a volcanic centre, and Canamax Resources Inc. completed a program of geochemistry, trenching and nine follow-up holes at Gaspard Lake (128), a new epithermal discovery. Other companies with small programs on the Fraser Plateau included Ballatar Explorations Ltd., Kookaburra Gold Corporation Ltd., Lexington Resources Ltd., and Noranda Exploration Company, Limited.

Coast Range Marginal Belt

Activity in the Coast Range marginal belt was down this year, with a few programs mostly on established properties. Lord River Gold Mines Ltd. continued with its underground exploration and sampling program at the Pellaire property (127), a series of epithermal gold-quartz veins in Kingsvale andesites, with the hope of increasing the known reserves. Kleena Kleene Gold Mines Ltd. continued drifting toward the downward projection of gold-bearing quartz veins exposed at surface on the Perkins Peak property (102), and planned to drift on a 2-metre wide quartz-sulphide vein encountered in last

year's drifting. Grab samples from this vein assayed 11 grams per tonne gold. Jacqueline Gold Corporation completed a small program of geochemistry, geophysics and drilling at the Newmac property (126), an old porphyry copper-gold prospect.

Other Areas

Two other properties on or near the Pinchi fault system were drilled in addition to the Indata, described earlier. Noranda Exploration explored a new discovery at Cluculz Lake (118) where gold occurs associated with carbonate and listwanite alteration zones in mixed argillaceous sediments, volcanics and serpentinites. Drilling was in progress following an earlier program of geochemistry, geophysics and trenching. Lac Minerals Ltd. competed 800 metres of rotary drilling on the York property (119) where gold occurs in graphitic shear zones in schistose host rocks, marked by high arsenic anomalies in soils.

X-Cal Resources Ltd. continued exploration of the lateral extent and continuity of the gold-antimony-bearing listwanite alteration zones at the Snowbird property (133) with a major program of percussion drilling, trenching, geochemistry and geophysics. The Main zone was traced for an additional 1.5 kilometres and a number of gold-bearing targets identified for winter drilling.

In the Swannell Ranges, Canmine Development Co. Ltd. completed a preliminary drilling program of eight holes on the Vega property (137) following the discovery of several gold geochemical anomalies in soils. Gold occurs in silicified zones in hydrothermally altered andesite breccias. An old adit was also sampled. The results were disappointing.

PLACER

Placer mining activity was up slightly from 1987, with expenditures by placer miners in the district (Cariboo and Omineca) estimated at over $10.5 million. Considerable interest was shown by miners in the changes to placer mining tenures under Bill 66, the Mineral Tenure Act, but no statistics on new placer claims staking, following proclamation of the Act, were available from the Titles Branch at the time of writing. Individuals and companies are increasing the use of more modern gravity separation equipment such as jigs and spirals in their plants, and are turning their attention to opportunities in mining buried channels or interglacial and preglacial deposits. Preido Mines Ltd., for example, at its Eight Mile Lake property (121) mined interglacial gravels below overburden and tailings from previous operations. In addition it drained the lake and tested interglacial gravels beneath the recent lake sediments.

COAL

The only company with a major exploration program outside its immediate production area was Quintette Coal Ltd. (131). Quintette completed 51 rotary and 16 diamond drill holes totalling over 8000 metres, exploring the Gates Formation along the structural trend of the Mesa and Mesa Extension pits. The bulk of this drilling was southwest of the Mesa area.

OPERATING MINES

There were two active coal mines and three active metal mines in the district. At the Bullmoose mine (138), Teck Corporation produced 1.7 million tonnes of clean coal, almost all of it being metallurgical grade. Quintette Coal (139) produced over 4.4 million tonnes of metallurgical coal and small shipments of thermal coal, with the bulk of the production coming from the Mesa and Mesa Extension pits.

Endako Mines Division of Placer Dome Inc. (140) milled over 9.8 million tonnes of ore grading 0.081 per cent molybdenum during the year, and concentrated on the ultimate design of the pit. Gibraltar Mines Ltd (141) milled 5 million tonnes of ore grading 0.31 per cent copper and 0.009 per cent molybdenum to mid-May, when the pit was closed by a labour dispute. The heap leach/electrowinning plant continued to produce at nearly 14 tonnes of cathode copper per day, most of which was stockpiled at the mine. Blackdome Mining Corporation (142) continued to mill approximately 200 tonnes per day of ore grading 25.5 grams gold and 74 grams per tonne silver. An aggressive program of more than 2250 metres of underground development plus surface and underground diamond drilling was concentrated on the No. 1 and No. 2 vein systems, but also included drilling or underground exploration of the Giant and Redbird veins and the newly discovered Watson vein.

KOOTENAY DISTRICT

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INTRODUCTION

Exploration activity in the Kootenay District in 1988 is comparable to that in 1986 but lower than 1987, as indicated by the 176 Notices of Work submitted to the end of October. These are distributed as follows: 82E, 19; 82F, 108; 82G, 12; 82J, 3; 82K, 34, and include 23 programs involving drilling of six holes or more. Of significance is renewed activity in the Rossland area. As well, evaluation of a number of old lode gold and silver producers continued.

As in 1987, work was directed almost entirely toward precious metal targets. Reserves were increased in a number of deposits including Tillicum Mountain (171), Willa (164), Abbot-Wagner (167), Golden Crown (176) and Nugget (152). The O.B.-Skylark mine (177) at Greenwood went into full production to become the third significant metal-producing mine in the district following the Sullivan (Cominco Ltd.) (150) and Silvana (Dickenson Mines Limited) (166). Tillicum Mountain (Esperanza Explorations Ltd.) (171) and Willa (Northair Mines Limited) (164) are at the development and advanced exploration stage respectively.

In coal exploration total drilling is somewhat less than the 24 000 metres recorded in 1987. Total production however increased by 4.6 million tonnes. There were no exploration programs for industrial minerals in contrast to the drilling programs for gypsum and magnesite last year.

EXPLORATION

Table 1 lists the more significant exploration programs completed or announced in the district during 1988. The project numbers in the table and the following text are keyed to the location map, Figure 2. Exploration programs are discussed by geographic area (NTS).

82E

At the Golden Crown property (176) of Consolidated Boundary Exploration Limited, continuity of mineralization in the King vein to about 40 metres below drift level has been established. An underground program of 600 metres of drifting, 12 diamond-drill holes (600 metres) and a raise to old workings was completed at a cost of $1.3 million. New reserves were quoted as 70 000 tonnes grading 13.8 grams per tonne gold.

Eight diamond-drill holes have been completed on the Sylvester K (178) gold-bearing pyrrhotite lens of Kettle River Resources Ltd. Mining of the deposit by Skylark Resources Ltd. is expected in 1989.

82F

Work in this area generally extended in a belt from Sandon in the north, through Nelson and Salmo, to Rossland in the south. In the immediate Nelson area, on the Great Western Group (158), Lectus Developments Ltd. continued its search for gold in silicified lenses in felsic volcanics. A total of 31 holes was followed by further geochemical sampling and an induced polarization survey. A joint venture program was inititated with U.S. Borax on the adjacent Star property (159). Near the property boundary there were interesting gold-silver intercepts in eight diamond-drill holes (up to 20.6 grams gold and 123.4 grams silver per tonne over 1.5 metres). Currently drilling is continuing on the Alma N, Star-Eureka and new S.E. zones.

Nearby, South Pacific Gold Corporation completed six diamond-drill holes for a total of 763 metres on the Shaft claims (157). Mineralization consists of chalcopyrite and gold in an altered diorite within the Rossland volcanics. A number of exploration programs in the Nelson-Ymir area are based on rehabilitation of old mine workings, together with surface exploration. The larger programs included the Yankee-Dundee of Kingsvale Resources Ltd. (155), the Wisconsin (Dutch Creek Resources Ltd.) (109) and the Blackcock mine of O'Hara Resources (156).

To the south near Salmo, drilling is in progress on the Arlington property (154) owned by Erie Mines Ltd., and Fairbanks Engineering Ltd. completed 640 metres of diamond drilling (surface and underground) on the Silver Dollar (153), targeting the extension of the Lucky Boy vein. An increase of reserves (203 000 tonnes averaging 10.3 grams per tonne gold) in all categories is reported by Gunsteel Resources Incorporated on the Nugget property (152) and a mill is in the planning stage.

The Rossland camp is experiencing renewed activity led by programs of Antelope Resources Limited on the Rossland claims (174) and property of the Rossland Mining School (173). Good intersections have been reported (34.3 grams per tonne gold over 3 metres true width) on the Bluebird-Homestake group of claims but the mineralization may have limited strike length. Mineralization in drill core occurs as massive pyrrhotite or mixed sulphides (arsenopyrite, pyrrhotite, pyrite,

chalcopyrite). Nearby, on the Giant property (172), Cominco Ltd. completed 15 holes near the former Red Mountain molybdenum mine, targeting a vein stockwork in a high-level monzonite intrusion. Other work in the Rossland camp in progress or being planned is by Kerr-Addison Mines Limited, Sulphurets Gold Corporation and Tobex Resources Ltd.

North of Nelson, GoldPac Investments Ltd. drilled 11 diamond-drill holes on the L.H. property (163) near Northair's Willa development, targeting silicified zones in Rossland Group volcanic rocks. Underground drilling and development took place at the old Standard Mine (165) of Silver Ridge Resources Inc. and the Comstock - Silver Cup property (161) of Dragoon Resources Ltd. Both companies are looking for feed for their mills located at Slocan and Ainsworth respectively.

In the Trout Lake area, Tri County Holdings Ltd. drilled nine surface holes (1100 metres total) to test the quartz-carbonate veins on the Winslow property (168). Results of sampling in surface trenches were more encouraging than drill-core assays.

Mikado Resources Ltd. continued to report good results on the Abbot-Wagner project (167). The Abbot ore was extended to the southeast and a new sulphide zone, called the Greenlaw vein, has been discovered in the Index Formation, 9 metres from the contact with the Badshot Formation, the host of the main silver-lead-zinc replacement deposit. A good road to the portal was completed earlier in the year. Mikado has reopened and sampled a number of other old workings in the area including the Bannockburn, Superior and Red Elephant properties. Results of sampling on the Red Elephant are particularly encouraging. Eleven samples from the shaft returned an average of 76 grams per tonne gold. Two trenches along an oxidized phyllite zone extending for 137 metres returned values of 25 grams per tonne gold 1 per cent copper over 3 metres, 20.6 grams per tonne gold and 3.3 per cent copper over 1.5 metres. A substantial program has been recommended for 1989. A new vein 1.3 metres wide, containing 40 to 50 per cent combined lead-zinc and 9 grams per tonne gold was discovered on the Superior claim in an area of glacier meltback.

82G

In the Cranbrook area, a number of deep holes were drilled into the Precambrian Aldridge Formation in search of another Sullivan deposit.

At Mark Creek (150) Cominco drilled to 2560 metres. Earlier in the year two deep holes by Cominco on the Vine property (180) were unrewarding. GoldPac Investments drilling (1770 metres) on the Bar property (162) also proved inconclusive. On the Giant property (179), Cominco is preparing another Sullivan play. Tourmaline is present and work this year involved a UTEM survey and surface mapping.

In what appears to be a new conceptual play, Chapleau Resources Ltd. is drilling altered Cretaceous(?) syenites and a quartz breccia on the Bar property (149) just west of Cranbrook. Associated silicification and argillic alteration are extensive. A 1525-metre drilling program is focused on a triangular zone at the junction of the Cranbrook and Palmer Bar faults. The silicified footwall and narrow quartz carbonate veins are anomalous in gold with the best grab sample to date running 10.6 grams per tonne gold. Mineralization is mostly pyritic but includes chalcopyrite (up to 0.5 per cent copper over 24.5 metres) and minor bornite, sphalerite and galena. Some of the quartz is vuggy and contains coarse pyrite. There is potential in the area for further exploration of intrusive rocks related to zones of structural weakness. British Columbia Geological Survey Branch Open File 1988-14 indicates several intrusive plugs in the area. It is possible that the nearby Moyie River placer deposits have their source in Cretaceous intrusions.

Further to the east, in the extreme southeast corner of the province, Fox Geological Consultants conducted a percussion-drilling program on the Howell Creek and Howe claims (143). Twenty-five percussion holes (3000 metres) were completed to test geochemical anomalies on both sides of Twenty-nine Mile Creek. Anomalous gold values appear to be related to sills, dykes, plugs and small stocks of probable Cretaceous age syenites intruding Paleozoic limestones.

DEVELOPMENTS

Esperanza Exploration Ltd. completed a 9100-metre surface and underground drilling program at the Tillicum Mountain project (171). The focus was on the East Ridge zone, a steeply dipping quartz skarn zone 24 metres wide, which has been traced for 550 metres along strike. The drill-tested mineralized horizon was extended during the year from a depth of 60 metres to 300 metres in this zone, which lies adjacent to a diorite porphyry sill. The main haulage level was advanced in the Heino-Money zone and additional reserves found below the 2112-metre level. Shrinkage-stope development began above the 2112-metre level. Reserves are quoted as 410 000 tonnes grading 11.7 grams per tonne gold but are expected to increase with new drill-indicated strike extension to the East Ridge zone.

At Northair's Willa project (164) underground drilling was focused on the southern extension of the West zone. Proven reserves have been delineated in the West zone and total 415 206 tonnes averaging 6.03 grams per tonne gold and 0.92 per cent copper. Additional geologic reserves (probable and possible) of 220 000 tonnes of similar grade are present. Post-breccia faults in this alkaline

porphyry system are postulated as an important geologic control of gold mineralization which is somewhat erratic.

Granges Exploration Ltd. conducted an ambitious exploration and development program on the Dorothy vein on the Goldfinch property (169). This consisted of 1830 metres of drilling, driving a decline of some 475 metres and developing two levels, the first about 400 metres long and the second, below it, about 100 metres. A bulk sample totalling some 7300 tonnes was taken. The quartz vein, arcuate in cross-section, pinches and swells along strike and plunges to the north. Mineralization appears to be cut off by post-mineral faults at a depth of less than 100 metres. One of the parallel veins in the East zone has some potential for continuity and tonnage, however, reserves outlined by present drilling are limited to 130 000 tonnes.

PRODUCERS

At the Silvana mine (166), steeply dipping sheared and mineralized structures have been found perpendicular to the main lode of silver-bearing lead-zinc ore. One of these structures is sufficiently large to be mined and grades 1370 grams per tonne silver with the only apparent sulphide present being sphalerite. Dickenson Mines Limited has been successful in using soil geochemistry to trace the main lode structure on surface through overburden. The main lode is cut by a number of low-angle faults which are not easily recognized. These faults are believed to displace lodes of other old mines to the north (for example Queen Bess). To date about 740 metres of exploration and development drilling, mostly underground, has been completed at Silvana.

The O.B.-Skylark silver-gold mine (177) at Greenwood is shipping ore grading 924.5 grams per tonne silver and 3.4 grams per tonne gold to the Dankoe mill at Keremeos where it is milled at a rate of 110 tonnes per day. Reserves are estimated at 54 500 tonnes. 1988 work involved 680 metres of drilling from surface and 1608 metres underground. There was 476 metres of drifting for development and stoping.

The Union Mine (175) reopened in April. By the end of August, 8 kilograms of gold and 243 kilograms of silver had been produced from 10 900 tonnes of ore by heap leaching. About 70 000 tonnes of tailings and old dumps are available for treatment.

Six thousand metres of mine development was completed at the Sullivan mine (150).

SOUTH-CENTRAL DISTRICT

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INTRODUCTION

Mineral exploration in south-central British Columbia continued at a high level during 1988 with the total number of exploration projects approximately the same as in 1987. The most active areas were the Okanagan region, including Vernon and Osoyoos Mining Divisions, the Adams Lake - Kamloops region and the Bridge River district (Figure 2). By year-end there were ten projects at various stages of review in the Mine Development Review Process (Table 3).

TRENDS AND HIGHLIGHTS

Exploration in the Okanagan region during 1988 was stimulated by the discovery of gold-silver mineralization in Tertiary volcanic sequences near Vernon and Okanagan Falls. Property acquisitions increased dramatically and a number of new operators have been attracted to the district. The newly discovered mineral occurrences with their tectonic settings are being compared with mineral belts in the western United States, resulting in a re-interpretation of previously known deposits and the development of new metallogenic models.

Activity in the Adams Lake region has stabilized following the production decision for the Samatosum deposit by Minnova Inc. The record level of project funding in 1987 helped establish commitment to several high-potential projects that continued to more advanced stages in 1988.

Interest in copper-gold mineralization associated with alkaline porphyries was rekindled by the current increase in copper prices. In the central Nicola Belt, the decision by Afton Operating Corporation to develop the Ajax deposit and the purchase of the Similkameen mine by Cassiar Mining Corporation, combined with generation of new targets such as the Man prospect, north of Princeton, demonstrate the industry's long-term confidence in deposits of this type.

The Bridge River district may soon be returned to the status of a producing mining camp. Two major projects - Corona Corporation's Bralorne Mine and the Congress property of Levon Resources Ltd. are in advanced stages of exploration, in anticipation of production decisions.

SUMMARY OF EXPLORATION ACTIVITIES

OKANAGAN

The announcement of high-grade gold intersections on the Brett Main Shear zone by Huntington Resources Ltd. and Corona Corporation precipitated a flurry of staking activity in the Whiteman Creek area, west of Vernon. The Brett claims (181) underwent extensive diamond and percussion drilling on three zones, including a newly discovered showing east of the Main Shear structure. Although the reported intersection of 71.6 metres averaging 69.6 grams per tonne gold was drilled down structure, it indicates the potential in the area for gold mineralization of substantial tenor.

Brican Resources Ltd. has completed a second phase of drilling on the adjacent Gold Star claims (182), which are in the same stratigraphic and structural setting as the Brett. Several kilometres south of Whiteman Creek, Lucky 7 Exploration Ltd. drilled targets near the White Elephant mine (183) for mesothermal gold mineralization hosted in Jurassic granodiorite.

East of Vernon, at Lumby, Quinto Mining Corporation began underground exploration drifting to test and bulk sample the Plateau gold zone (184). The company is continuing with Stage I studies for the Mine Development Review Process and has examined the possibility of importing a mill for processing ore.

Brenda Mines Ltd. began a sampling and drilling program on the nearby Bearcub feldspar property (185). Feldspar occurs in pegmatite bodies intruding foliated quartz diorite. Elsewhere in the area, QPX Minerals (Minequest Exploration Associates Ltd.) drilled precious metals anomalies associated with argillic alteration zones in Tertiary rhyolitic volcanic rocks on the Creighton property (186). El Paraiso Resources Ltd. carried out drilling on the Top claims (187) near Monashee Pass and Approach Resources Ltd. drilled the Pita claims (188) in the same area. At Lavington, Triple Star Resources Corporation completed underground and surface drilling at the Kalamalka mine (189), another mesothermal lode-gold system in Jurassic dioritic rocks.

West of Peachland, Placer-Dome Inc. and Fairfield Minerals Ltd. jointly operated a major drilling program on the Oka property (190). This is the only major gold-skarn project in the district outside the Hedley Camp.

In the southern Okanagan region near Okanagan Falls, Inco Gold Company continued with an expansive definition-drilling program on the Vault deposit (191), where epithermal gold-quartz mineralization occurs with widespread silicification in Tertiary laharic and epiclastic breccias.

At the nearby Dusty Mac mine (192), Minnova Inc. has undertaken a drilling program to re-evaluate the potential for structurally controlled gold mineralization on the property. Several kilometres to the east, Tigris Minerals Ltd. drill-tested precious metals targets on the Venner property (193), optioned from Corona Corporation. Quartz-carbonate vein mineralization occurs in Tertiary rocks that are possibly correlative with those at the Vault and Dusty Mac. This area will likely see increased exploration activity in the coming year.

West of the Okanagan Valley, near Olalla, Greenlake Resources Ltd. started drilling on the Golden Plug (194). Further north, QPX Minerals (MineQuest) began work on the Astro 1 claims (195). In both areas targets are precious metals associated with volcanic structures in the Tertiary White Lake Basin.

In the Fairview Camp, near Oliver, the Valhalla Gold Group (Oliver Gold Corporation) has submitted a prospectus to the Mine Development Steering Committee to re-open the historic Fairview (196) and Stemwinder (197) properties. Previously reported reserves approximate 700 000 tonnes, grading 3.7 grams per tonne gold, but, current work suggests there is potential for substantially higher tonnages. Mineralization occurs as deformed quartz veins in foliated metasedimentary and metavolcanic rocks of Late Paleozoic to Early Mesozoic age. Oliver Gold Corporation and associated companies have operated underground and surface exploration programs on the Fairview belt for the past three years.

HEDLEY

In the Hedley district, Corona Corporation has continued to maintain an active exploration profile with work on the Nickel Plate (200) and Canty (201) properties. At the Nickel Plate mine approximately 600 metres of drifting was completed to drill-test zones on the Bulldog and Horsefly-Terrier claims, owned by Golden North Resource Corporation. A major surface-drilling program was carried out in the Canty mine area and underground drilling was also completed to test the Eagle's Nest claims (202) optioned from Agio Resources Corporation.

Southeast of Hedley, Chevron Canada Resources Ltd. continued with its Similkameen (Lost Horse, 203) drilling project. Candorado Mines Ltd. successfully started up a gold tailings leach operation (204) near the town of Hedley, and a second tailings recovery project (205), initiated nearby by Sumac Ventures Inc., is currently undergoing Stage I Mine Development Review studies.

In an agreement with Noranda Exploration Company, Limited, Total Energold Corporation optioned the Banbury Gold Mines Ltd. property (206). Previous work by Noranda focused on gold-skarn targets and resulted in a reported mineral inventory of approximately 3.6 million tonnes, grading 1.7 grams per tonne gold. In addition to skarn targets in the North Contact zone, Total Energold's work has been directed toward underground development and drilling on the Pine Knot vein system, where proven reserves of about 160 000 tonnes, grading 10.97 grams per tonne gold have been reported.

PRINCETON - TULAMEEN

Cassiar Mining Corporation became a major new player in the Similkameen Mining Division with its purchase of the Copper Mountain - Ingerbelle mine complex (207) from Newmont Mines Ltd. for $10 million. In addition to recalculation of the reserves, Cassiar (Similko Mines Ltd.) has also undertaken a re-evaluation of all exploration targets and plans to maintain an on-going exploration program.

In the Tulameen area, west of Princeton, Huldra Silver Inc. continued with underground exploration of the Treasure Mountain silver-lead-zinc deposit (208). Substantial development work and underground drilling were completed, together with limited surface exploration. The vein mineralization occurs in Jurassic and Cretaceous sedimentary rocks. It is sulphide rich and quartz poor, with some exceptionally high silver values. Results of work to date appear to indicate excellent silver-producing potential for this property.

West of Treasure Mountain, Harrisburg-Dayton Resource Corporation began a major assessment of the Summit Camp claim group (209). The vein system on this property is believed to be on the same structural trend as the Treasure Mountain zone.

At Grasshopper Mountain (210), on the Tulameen River, Longreach Resources Ltd. undertook a percussion drilling project to evaluate the bulk-tonnage potential of platinum-group elements in chromite-bearing dunite of the Tulameen ultramafic complex. Work on this property was initiated in 1987 by Newmont. Immediately to the north, Bordeaux Resources Ltd. drill-tested polymetallic sulphide targets on the Rambler claim group (211). Mineralization occurs in chlorite and sericite-altered metavolcanic and metasedimentary rocks of the Nicola Group.

NICOLA VOLCANIC BELT

Near the south end of Missezula Lake, Brican Resources Ltd. completed a comprehensive exploration program on the Man property (212). Targets are disseminated copper-gold mineralization associated with alkalic porphyries intruding Nicola rocks. Several kilometres to the northeast, Placer Dome Inc. and Fairfield Minerals Ltd. continued with trenching and surface surveys on the Elk claims

(213), where precious metals in quartz veins are associated with clay-altered and brecciated granitic intrusions.

In the Aspen Grove area, Gerle Gold Ltd. drilled several holes on the Snowflake property (214). Copper and gold mineralization occurs in fractured and brecciated Nicola volcanic rocks that are cut by syenite and gabbro intrusions. North of Merritt, Minnova Inc. tested a number of targets at the old Stump Lake property (215). Gold-bearing quartz veins (Enterprise, King William, Jenny Long) occur in sheared and sericitized Nicola tuffs. At Swakum Mountain, Corona Corporation drilled on the Lucky Mike (Alameda) property (217), where copper and magnetite-bearing garnet-skarn mineralization is developed in calcareous Nicola tuffs and sedimentary rocks. Several holes were also drilled by H. Kruse on the adjacent HK property (218).

KAMLOOPS AREA

Much of the exploration effort near Kamloops was directed to copper-gold porphyry targets in the Iron Mask batholith. Afton Operating Corporation (Teck) carried out a definition-drilling program on the Crescent (Comet-Davenport) deposit (220) to confirm reserves prior to production. The company also drilled similar porphyry targets on the Sunny (221) and M & R (222) properties. In the same area, Abermin Corporation completed a substantial program on the Galaxy prospect (223) to the north of Afton's Ajax deposit.

Northwest of Kamloops, QPX Minerals tested epithermal gold targets on the Mara property (227) where mercury, arsenic and antimony anomalies are associated with silicic alteration in Kamloops Group basaltic rocks.

ADAMS LAKE AREA

The area west of Adams Lake was again the focus of several major exploration projects. At mid-year Minnova Inc. and Rea Gold Corporation announced that they would proceed with development and production of the Samatosum silver deposit (228). In addition to extensive diamond drilling, bulk sampling, pit development and mine construction on the Samatosum property, Minnova Inc. continued with a comprehensive assessment of the massive sulphide potential in the Eagle Bay and Fennell stratigraphy on the Bar and Chu Chua claim groups (50). The company also tested lode-gold targets on the Gold Hill property (240), while to the north, Kerr Addison Mines Limited completed its work on similar quartz-lode mineralization at the Windpass mine (241).

Earlier in the year Rea Gold extended its underground drilling and bulk sampling program to include three crosscuts through the L98 lens on the Rea Discovery zone (229). The company is also continuing with work on the CK metasediment-hosted sulphide deposit (244) on the Raft River, northeast of Clearwater.

In the Sinmax Creek area, Esso Minerals Canada has completed drilling programs on the Homestake mine (232), Twin (231) and Cana (237) prospects. All three are massive sulphide targets in Eagle Bay rocks. To the east, at Squaam Bay, Falconbridge Limited continued work on the Bay claims (233) with trenching and surface surveys. Further south, National Resources Exploration Ltd. completed a limited drilling program on the Steep claims (236), a skarn-associated gold prospect.

BP Resources tested another massive sulphide prospect on the CM property (239) northeast of Barriere and further east National Resources Exploration drilled the White Rock claims (238) near North Barriere Lake. North of Birch Island, Placer Dome began work on the Nobel massive sulphide property (243). To the south, at Foghorn Mountain (242), Gold Spring Resources Ltd. carried out a substantial drilling program on the Foghorn claims.

East of Adams Lake, on the plateau, Adams Exploration Ltd. (Spencer Engineering) operated two short drilling programs on the Adam property (235). The adjacent Lucky Coon prospect (234) was drilled by Sirius Resource Corporation, under an option agreement with Adams Exploration, and north of Shuswap Lake, Brican Resources Ltd. drilled several targets on its Scotch Creek property (245).

REVELSTOKE AREA

The J & L deposit (246) was again the only exploration property in the Revelstoke area that saw major work during 1988. Pan American Minerals Corporation completed several hundred metres of drifting and raising to obtain further bulk sample material, as well as attempting to improve the ore reserves. Later in the year the company amalgamated with Equinox Resources Ltd., which has initiated an infill drilling program and expects to undertake major exploration and development work in 1989.

BONAPARTE PLATEAU

Several epithermal and mesothermal precious metals targets were drilled in the Deadman Creek, Vidette Lake and Little Fort areas. Inco Gold began work on the Epi-Gnome (247) property and Booker Gold Explorations Ltd. drilled several holes at the Vidette prospect (248). To the south, the Eastmo claims (249) were drilled by Charles Boitard, while east of Bonaparte Lake, Titan Resources Ltd. drilled the 750M property (250).

Northeast of Little Fort, Vital Pacific Resources Ltd. completed a major drilling progam on the Haida Gold prospect (251), and in the same area, Rat Resources Ltd., Geotech Capital Corporation and

Lancer Resources Inc., respectively, drilled the Ta Hoola (252), Bogg (253) and HC (254) claim groups. The target in each area is mesothermal precious metal deposits associated with Upper Triassic Nicola volcanic rocks.

BRIDGE RIVER GOLD CAMP

Exploration for gold-silver vein deposits in the Bralorne and Gold Bridge area in 1988 was highlighted by substantial underground drilling and development projects. In particular, the Bralorne mine (255) was re-opened for exploration by Corona Corporation, which has submitted a prospectus for Mine Development Review and is currently carrying out Stage I studies. Preliminary reserves in all categories are estimated to be 292 086 tonnes grading 9.92 grams per tonne gold above Level 1000, plus an additional 673 068 tonnes grading 8.23 grams per tonne gold below Level 1000.

Levon Resources Ltd. has continued with major exploration and development work on the Congress property (256) and has recently submitted a Stage I report to the Mine Development Steering Committee. The 1988 work was concentrated on the Upper and Lower Howard zones, the Lou decline and rehabilitation of the Congress adit. Reserves have been estimated at approximately 157 000 tonnes grading 9.15 grams per tonne gold in the measured and indicated catagories, plus 294 000 tonnes grading 10.39 grams per tonne gold in the inferred catagory. Levon's second major project in the district is at the Love Oil property (264), where an adit was driven, following detailed surface surveys and a trenching program. This property is adjacent to the King zone, which is part of the Bralorne mine complex.

Avino Mines and Resources Ltd. carried out a drilling project on the Minto property (257), east of the Congress workings, and to the south of Carpenter Lake the same company drilled several targets on the Olympic property (258). In the same area, Manhattan Mineral Corporation drilled the Golden Sidewalk (259) property, Hoyle Resources Inc. completed a program on the LJ (260) claims and Menika Mining Ltd. continued with a major drill testing of several zones on the Reliance property (261).

Chevron Canada completed its appraisal of the Wayside property (262) with several drill holes and to the west, Hi-Tec Resource Management Ltd. drilled the Mount Allard Resources Ltd. Gun Creek property (263). East of the Gold Bridge area, Westmin Resources Limited carried out a comprehensive trenching and drilling program on the Bristol Gold claims (265).

TYAUGHTON - YALAKOM AREA

In the area north and northeast of the Bridge River Camp, epithermal gold targets were tested at several localities. Esso Minerals Canada drilled several holes on the Relay Creek prospect (266) and to the south, Millenium Resources Ltd. began work on the Eva claims (267). South of the Blackdome mine, Lexington Resources Ltd. completed major drilling and trenching work on the Bobcat property (268).

Northwest of Lillooet, near the Fraser River, Chevron Canada tested targets on the Stirrup Creek property (269) and Hi-Tec Resource Management completed work on the Edge claims (270), owned by Brenwest Mining Ltd. Southwest of Lillooet, Kerr Addison Mines Limited completed an appraisal of the Spray-Foam claims (271) near Cayoosh Creek.

OPERATING MINES

Strong copper prices and the currently stable environment for gold production have greatly improved profitability, ore reserves and mine development plans in south-central British Columbia.

The Highland Valley Copper joint venture operated throughout 1988 at an average production rate of 120 000 tonnes per day, with a stripping ratio of 0.9:1. At the beginning of the year the joint venture announced plans to move and incorporate the two Highmont mills into the Lornex milling complex at an estimated cost of $70 million. Construction is reported to be on schedule and the addition is expected to be on stream by May 1989. The milling rate will then be increased to 131 000 tonnes per day. Current reserves are in the order of 770 million tonnes grading 0.4 per cent copper and 0.008 per cent molydenum (combined Lornex and Valley pits).

Afton Operating Corporation began production from the Crescent pit (Comet-Davenport property) in 1988 following depletion of reserves in the Pothook zone last spring. The Crescent zone contains reserves of 1.07 million tonnes grading 0.46 per cent copper and 0.206 gram per tonne gold. The company has announced that it will develop the Ajax property, several kilometres south of Kamloops, and process the ore at the Afton mill. The Ajax project is currently under review by the Mine Development Steering Committee. Ajax reserves total 24.5 million tonnes grading 0.46 per cent copper and 0.34 gram per tonne gold. Capital costs are expected to be $11 million. The company currently operates at an average production rate of 7500 tonnes per day, but will increase to about 10 000 tonnes per day when the Ajax pit comes on stream.

The Copper Mountain - Ingerbelle mine complex south of Princeton was purchased in 1988 by Cassiar Mining Corporation from Newmont Mines Limited for $10 million. The new company, Similko Mines Ltd., is mining approximately 20 000 tonnes of ore per day. Current reserves are:

proven, 47 million tonnes grading 0.46 per cent copper; probable, 103 million tonnes grading 0.42 per cent copper.

Since opening in 1987, production at the Nickel Plate mine has been maintained at an average rate of about 2450 tonnes per day, with a 9:1 stripping ratio. Open-pit ore is currently being blended with ore mined from selected underground zones. Ore reserves are approximately 8.25 million tonnes grading 3.02 grams per tonne gold. During 1988 Corona Corporation maintained an exceptionally high level of exploration in the mine area and on adjacent properties.

Brenda Mines Ltd. produced at a daily rate of 30 000 tonnes, for a 1988 total of approximately 10.9 million tonnes. Current reserves are 15 million tonnes grading 0.167 per cent copper and 0.39 per cent molybdenum. In March of 1988 the company received a discount on its electrical costs, which extended the life of the mine to mid-1990.

At Beaverdell, Teck Corporation's Highland Bell mine operated at 100 tonnes per day throughout 1988. From 1900 to the end of 1988 the mine has produced 1150 tonnes of silver.

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SUMMARY AND OUTLOOK

Exploration activity in the Southwestern District remained strong during 1988, particularly on Vancouver Island. Interest in the Sicker volcanic belt was sustained by the fact that Abermin Corporation on the Lara property and Westmin Resources Limited on the Debbie/Yellow project both went underground to collect bulk samples and to provide access for easier definition of ore reserves. It is anticipated that interest in the Sicker belt will remain strong in 1989. Likewise, the continued success of McAdam Resources Inc. on the Spud Valley project at Zeballos, and of Better Resources Ltd. at Mount Washington has maintained interest in the Tertiary gold potential of those areas. The interest in gold-bearing skarn occurrences, which was restricted mainly to Texada Island in recent years, has revived in the skarn camps of northern Vancouver Island. There has also been some renewed interest in the porphyry copper-gold belt west of the Island Copper mine at Port Hardy. This renewed interest in gold skarns, porphyry copper-gold deposits, and Tertiary gold mineralization, together with the fact that the British Columbia Regional Geochemical Survey covered northern Vancouver Island and the adjacent mainland in 1988, is expected to generate a major increase in mineral exploration on northern Vancouver Island and possibly a staking rush when the RGS data are released in 1989.

On the southwestern mainland, interest in Tertiary gold mineralization related to the Harrison Lake - Lillooet River break remains strong, with reports of new discoveries on the Abo (Harrison Gold) property at Harrison Hot Springs. Minnova Inc. is continuing to enjoy geological and drilling success in its systematic search for volcanogenic massive sulphides in the Britannia roof pendants of Gambier Group volcanic rocks. The volcanic roof pendants in the Coast crystalline belt, particularly those more remote from the Lower Mainland, have been under explored in recent years, mainly due to their rugged topography and difficult access when compared to the Sicker Group on Vancouver Island. The release of RGS data for NTS 92K in 1989 is expected to stimulate some more aggressive activity in the coastal roof pendants by companies and individuals anxious to break new ground.

Activity on the Queen Charlotte Islands has remained subdued in 1988 as most exploration people with an appreciation of the potential for further discovery of epithermal gold on the islands wait to see how successful City Resources (Canada) Ltd. will be in bringing the Cinola gold project to production.

EXPLORATION AND PROPERTY DEVELOPMENT

Table I lists all those exploration and development projects in the Southwest District on which some significant amount of drilling, underground exploration or exploration is known to have been done in 1988. The map numbers listed in the table and shown in brackets after property names in the following text are keyed to the location map, Figure 2.

VANCOUVER ISLAND

As has been the case for several years, the major concentration of large-budget projects in the district is in the Cowichan - Horne Lake uplift of Sicker Group rocks, a package of Paleozoic volcanic and sedimentary rocks extending from Duncan to Port Alberni. West of Chemainus, on the Lara property (274), the joint venture of Abermin Corporation and Laramide Resources Limited completed approximately 600 metres of drifting and raising in the Coronation massive sulphide zone, resulting in the surface stockpiling of a 10 000-tonne bulk sample. The latest published estimate of drill-indicated reserves is 529 000 tonnes averaging 1.01 per cent copper, 1.22 per cent lead, 5.87 per cent zinc, 100.1 grams per tonne silver, and 4.73 grams per tonne gold. Late in the year Laramide Resources purchased Abermin's 65 per cent interest in the property for $2.3 million plus a 10 per cent "profits-of-production" royalty. Laramide, in turn, optioned the property to Minnova Inc. and Minnova has now assumed responsibility for further exploration and development. Minnova has also continued exploration on its extensive Mount Sicker property (273) where 5500 metres of diamond drilling was completed early in 1988 and a similar amount is planned to begin late in the year.

Falconbridge Limited, in a joint venture with Esso Minerals Limited, also continued aggressive exploration of its Chemainus property (275) comprised of two large claim blocks adjoining the east and west sides of the Lara property. The company drilled over 10 000 metres in a spring program and resumed drilling late in the year. The areas of interest on all three of the above properties occur in a belt of felsic volcanic rocks on strike with the Coronation zone and the old Lenora and Tyee mines on Mount Sicker.

At the northwest end of the Cowichan - Horne Lake uplift, near Port Alberni, the joint venture of Westmin Resources Limited and Nexus Resource Corporation, with Westmin as operator, has committed a budget of $6 million to further explore the large and very promising Debbie property (282), which now includes the centrally located Yellow claim previously explored separately by the Nexus group of companies. Most of the funds have been allocated to driving a 2020-metre tunnel through McLaughlin Ridge which, when completed early in 1989, will provide underground drilling access to the Mineral Creek and Linda mineralized zones and will allow removal of a bulk sample from the Mineral Creek zone for metallurgical testing. The gold mineralization in the Mineral Creek zone occurs in a quartz-carbonate-altered regional fault and has been traced by surface drilling over a strike length of at least 500 metres and a vertical distance of 700 metres within the fault. The Linda zone consists of a network of gold-quartz veins in the unaltered hangingwall of the Mineral Creek fault. Surface drilling is planned to resume late in the year and will include further testing of the 900 zone, located about 1.6 kilometres southwest of the Mineral Creek zone. At the 900 zone, a gold-bearing chert formation overlies a high-grade gold-bearing quartz stockwork. In addition to the underground work and surface drilling, the 1988 program on the Debbie project has been highlighted by detailed and comprehensive geological mapping of the entire 60 square kilometre property by a crew of up to ten geologists.

Elsewhere in the Sicker belt, Nexus Resource Corporation drilled seven holes totalling 1205 metres on the Thistle property (281) where massive sulphides containing gold, silver and copper occur in sheared mafic volcanics. Minnova Inc. drilled seven short holes and Saga Resources Ltd. drilled five holes on the Heather (277) and Snapper (278) properties respectively, in the Nitinat River area northwest of Cowichan Lake.

Cream Silver Mines Limited attracted considerable publicity early in 1988 when it succeeded in drilling four holes totalling 2163 metres to test a geophysical anomaly on its mineral claims at the south end of Buttle Lake in Strathcona Park (284). All of the holes intersected low-grade silver-zinc-copper mineralization in rhyolitic rocks of the Sicker Group, apparently directly on strike with the mineralized stratigraphy on the adjacent Myra Creek mine site of Westmin Resources. The company later applied for a resource-use permit to drill more promising anomalies further up the Price Creek valley and in the same favourable stratigraphy. That plan was abandoned when the Provincial Government announced in late summer that no further mineral exploration would be permitted in Strathcona Park outside the Westmin mine property.

One other project in Sicker Group rocks is on the Songbird property (290) near Nanoose Bay where Mingold Resources Inc. is presently trenching and carrying out reverse circulation drilling. The target is a series of gold-silver-bearing quartz veins associated with a regional north-trending fault that separates Late Triassic basalts of the Karmutsen Formation from metamorphosed volcanic rocks mapped as part of the Nanoose uplift of the Sicker Group.

The Mount Washington epithermal gold camp west of Courtenay has been the site of four separate drilling programs in 1988. The target in all cases is epithermal gold-silver-copper-arsenic mineralization associated with a Tertiary eruptive centre and localized in flat faults or diatreme-like breccia zones. The major project is centered on the north arm of Mount Washington (293), where Better Resources Ltd. drilled 5392 metres in 67 holes, mainly involving close-spaced definition drilling of the Lakeview-Domineer zone. The latest published reserve estimate on the Lakeview-Domineer zone is 428 000 tonnes grading 8.8 grams gold and 43.5 grams per tonne silver. On the east flank of the mountain, Noranda Exploration Company, Limited, under an option from Better Resources, drilled the Murex breccia (294) where Better has previously intersected 7.2 grams per tonne gold over 12.8 metres and 1.54 per cent copper over 33 metres. In the Divers Lake area southwest of Mount Washington, Noranda drilled eight holes to test coincident soil and geophysical anomalies on a property optioned from Iron River Resources Ltd. (296). Finally, the joint venture of Visible Gold Inc. and Westmin Resources Limited announced plans to drill approximately 4900 metres, late in the year, on the Dove property (295) where at least five target areas have been identified on the basis of surface showings and coincident soil and geophysical anomalies.

Activity in the Zeballos gold camp has been highlighted again in 1988 by the sustained success of McAdam Resources Inc. at the Spud Valley property (287). Underground exploration has been ongoing through 1988 with drifting and sampling of several veins, including the previously-mined Goldfield and Spur veins. Underground diamond drilling totalling 5400 metres was completed earlier in the year. Reserves in all categories are currently estimated by McAdam at 224 000 tonnes grading 14.1 grams per tonne gold, but it is anticipated that reserves can be increased significantly as a result of the current work. The gold-silver mineralization occurs in quartz veins along shears and fractures cutting the Tertiary age Zeballos quartz diorite stock. At the adjoining Privateer mine site (286), New Privateer Mines Ltd. periodically carried out additional underground bulk sampling in preparation for the contemplated completion of a pilot mill. Footwall Exploration Limited has optioned the Hiller-Churchill property (288), a series of variably auriferous magnetite skarn deposits running northwestward from Zeballos to the Artlish River. The property owner, Falconbridge Limited, drilled several of the zones in 1985 and found the most northwesterly deposit, known as A-25, to contain the highest gold values, including one drill intersection of 310 grams per tonne gold across 2 metres. Footwall has gone directly underground on A-25 in 1988 with an adit and a raise into the gold-rich

mineralization. Sampling of the underground opening is reported to have confirmed the previous high gold assays.

In the Kennedy River gold camp, International Coast Minerals Corporation is continuing to report significant results from its ongoing drill program on the Bear project (283), which involves re-examination of several old mine workings and showings on the west side of the Kennedy River. Most recently the company has reported some good intersections, including 7.6 grams per tonne gold, 108.7 grams per tonne silver, and 1.71 per cent copper across 2.6 metres, from a gold-sulphide quartz vein called the Shack vein. Prospecting near the Shack vein has discovered a broad area of gold-silver-copper-bearing skarn, a type of mineralization not previously considered to be important in the Kennedy River camp.

Other gold projects on Vancouver Island include Valentine Mountain (272) north of Sooke where Valentine Gold Corporation, and more recently the property owner, Beau Pre Explorations Ltd., have drilled a total of 15 holes with more planned before year-end. A small pilot mill was tuned up early in the year and processed 391 tonnes of material from the Discovery zone.

Nuspar Resources Ltd. completed small programs of diamond and rotary drilling to test scattered gold occurrences on its Mount Vernon prospect (276) southwest of Cowichan Lake. At the Contact property (279) near Ahousat on Flores Island, Parallax Development Corporation and Au Resources Limited drilled 18 holes testing coincident geophysical/geochemical anomalies and some narrow quartz-sulphide veins locally carrying very high gold and silver values. Centaur Resources Limited drilled approximately 300 metres at the Head Bay property (280) between Gold River and Tahsis. The drilling was intended to test the Road showing, described as a diorite-hosted shear zone containing narrow, parallel quartz veins with assays up to 201 grams per tonne gold. Late in the year, Dalmation Resources Limited began a diamond-drilling program to further test gold-bearing quartz-breccia and quartz-vein occurrences on the Tay property (285) on the Taylor River west of Port Alberni. Defiant Minerals Inc. drilled three holes totalling 244 metres on the Iron Cop property (289) inland from Brooks Peninsula. At the Andy and Joe claims (299) on Storey Creek just east of Nimpkish Lake, Hercules Ventures Inc. has begun a drilling program on a base and precious metal skarn prospect owned by West-Mar Resources Ltd.

Finally, at the northern end of Vancouver Island, there has been renewed interest in the porphyry copper-molybdenum-gold occurrences previously explored by BHP-Utah Mines between the Island Copper mine and Holberg. The huge Expo property (300) which covers 109 square kilometres has been optioned from BHP-Utah Mines by Moraga Resources Ltd. Moraga is currently conducting close-spaced drilling on the Hushamu porphyry deposit where drill indicated mineable reserves of 52.2 million tonnes grading 0.32 per cent copper, 0.008 per cent molybdenum, and 0.41 gram per tonne gold have previously been reported. Crew Natural Resources Ltd. drilled four holes at its Red Dog property (301) which is surrounded by, but separate from the Expo claims. BHP-Utah Mines, under a previous option agreement, is reported to have identified a drill-indicated reserve at the Red Dog of 63.5 million tonnes with an average grade of 0.6 per cent "copper equivalent." At the Realgar property (302) on the San Josef River near Holberg, Formosa Resources Corporation drilled four holes to test a strong arsenic-mercury anomaly soil which surrounds a showing of realgar-cinnabar-orpiment veining in an outcrop of weakly altered limestone. Minor copper and gold values accompany the mineralization.

INNER ISLANDS

Gold exploration on Texada Island took a promising new turn in 1988 when three major companies completed separate option agreements which cover all of the significant claim holdings on the northern half of the island. Echo Bay Mines Limited optioned all of the extensive holdings of Rhyolite Resources Inc. which cover numerous vein and skarn occurrences at the northern end of the island and the gold-bearing ferrocarbonate-altered shear zone on the Angel claims. Freeport-McMoRan Gold Company optioned the holdings of Vananda Gold Limited which include most of the major copper and iron skarn showings and former mines in a belt crossing the island from Vananda to Gillies Bay. BP Resources Canada Limited optioned a block of claims from local prospectors which surrounds Comet Mountain from Raven Bay to Pocahontas Bay. The three companies cooperated on a joint airborne geophysical survey of all three properties and then they each followed up on the ground with detailed mapping, sampling and other surveys. Only Freeport-McMoRan on the Vananda Gold property (292) has signalled an intention to undertake diamond drilling in 1988.

On the Aladdin property (291) at the west end of Lasqueti Island, the joint venture project by H.Q. Minerals Ltd. and Dornoch International Ltd. completed six drill holes totalling 427 metres, targeting shear-controlled, sulphide-rich quartz veins within and close to the old St. Joseph mine workings.

Lone Jack Resources Limited completed a program of drilling and trenching begun in late 1987 to test several gold-silver-bearing copper skarn showings surrounding, but not including, the former Lucky Jim mine in the limestone belt of Quadra Island (298). Also early in the year, Rea Gold Corporation in a 50-50 joint venture with Verdstone Gold Corporation completed 1163 metres of diamond drilling in 13 holes on the White Pine gold-siilver vein prospect (309) at the north end of East Thurlow Island.

SOUTHWESTERN MAINLAND

The most advanced exploration project in the mainland part of the district is the Harrison Gold project on the Abo property (315) near Harrison Hot Springs, currently owned and operated by Bema International Resources Inc. At the beginning of 1988, the property was being explored by a joint venture among Bema, Abo Resource Corporation and Kerr Addison Mines Limited, with Kerr Addison as operator. Initial work included 2912 metres of surface drilling in 16 holes at the Portal stock. By mid-year, Bema International had acquired a controlling interest of Abo Resource Corporation, had bought out Kerr Addison's 25 per cent interest in the property, and had taken over operation of the project. Bema remapped the entire property, conducted extensive new geophysical and geochemical surveys, and presently is engaged in an aggressive drilling program costing $1.25 million and using one underground and two surface drills. Mineralization on the property consists of gold-bearing quartz-vein stockworks confined within several Tertiary quartz diorite stocks. The latest published reserve estimate by Bema was 4.45 million tonnes averaging 3.4 grams per tonne gold in the Jenner stock alone

Elsewhere along the regional Harrison Lake break, Universal Trident Industries Inc. has optioned the Doctors Point epithermal gold-quartz vein prospect (3121) from Rhyolite Resources Inc. and has begun a late-season drilling program. Just north of Doctors Point at Five Mile Bay on Harrison Lake, LMX Resources Limited optioned the Toil property (311) from Diamond Resources Incorporated and drilled three holes into a showing of disseminated volcanogenic sulphides. On the Lillooet River opposite Skookumchuck, in a similar geological environment, Symes Resources Ltd. has done some diamond drilling and is continuing with geological and geochemical surveys on the Easy and Jo claims (313) optioned from Hillside Energy Corporation and Corona Corporation.

Minnova Inc. completed diamond-drilling programs on two properties in the Britannia area, targeting polymetallic massive sulphides in Early Cretaceous Gambier Group volcanic rocks. A total of 1446 metres in 11 holes were drilled in mineralized felsic volcanic rocks on the extension of the Britannia shear zone along Furry and Clipper creeks. The Furry Creek property (304) is optioned from Fleck Resources Limited. Minnova also drilled five holes totalling 1823 metres to further explore a volcanogenic massive sulphide zone on a property at the head of Indian River optioned from International Maggie Mines Ltd. (305). One drill intersection on the zone in 1987 gave 10.8 per cent zinc and 4.5 grams per tonne gold across 0.6 metre.

On Callaghan Creek near Whistler, Falconbridge Limited is exploring Northair Mines Limited's former producing Warman mine (308) and surrounding claims. The 1988 program consisted of opening up and resampling the 2800 level adit, drilling five surface holes totalling 1635 metres, and additional geophysical surveys. The Northair mine occurs within a large pendant of Gambier Group rocks and the exploration targets are volcanogenic massive sulphides or associated precious/base metal sulphide veins.

At the north end of Lillooet Lake near Pemberton, Green Lake Resources Ltd. drilled approximately 2000 metres early in the year to further explore a newly discovered pyritic massive sulphide zone in Cadwallader Group volcanic rocks on the Lill property (318). Minnova completed further drilling at its North Fork (317) polymetallic massive sulphide prospect on Cogburn Creek east of Harrison Lake.

Additional gold-oriented projects on the mainland include a limited program of prospecting and underground drilling at the Ashlu mine (307) optioned by Valentine Gold Corporation from Tenquille Resources Inc. and a single drill hole by Skyrocket Exploration and Resources Inc. at its Sky property (310) just west of Stave Lake.

Two drilling projects were underway late in the year just east of the Hozameen fault. Adjacent to the western boundary of Manning Park, Bethlehem Resources Corporation is engaged in an aggressive program of surface and underground drilling in and around old workings on the AM breccia pipe, one of several mineralized zones on a property known as Giant Copper (314). The goal is to upgrade the gold reserves in the AM zone where reserves of 2.5 million tonnes grading 1.35 per cent copper, 0.033 per cent molybdenum, 24.7 grams per tonne silver, and 0.58 gram per tonne gold have previously been reported. In a very similar geological setting on the Anderson River east of Spuzzum, New Lintex Minerals Ltd. is drilling on its Gilt Creek gold prospect (316).

QUEEN CHARLOTTE ISLANDS

Mineral exploration on the Queen Charlotte Islands remained at a low level in 1988 as the industry waited for decisions about development approval at Cinola and the disposition of mineral properties within the South Moresby federal park reserve. These decisions will significantly affect the climate for future mineral exploration and development on the islands.

Four of the six advanced exploration projects on the islands occur along the trend of the Sandspit fault system where the target is epithermal gold mineralization of the Cinola type. At the Cinola property (321), City Resources (Canada) Limited released results of a preliminary feasibility study reporting mineable reserves of 23.8 million tonnes grading 2.45 grams per tonne gold at a 1.1 grams per tonne cutoff. The proposal is to mine 2.1 million tonnes per year for a mine life of 12 years. In addition to the feasibility study, 1988 work has included further geophysical surveys, metallurgical testing, various environmental studies and 4073 metres of diamond drilling in 52 holes. Some of the drilling was for geotechnical data on the mill site and tailings area and the remainder was exploration drilling in the vicinity of the defined orebody.

The other drilling projects along the Sandspit fault included 440 metres in six holes by City Resources on the Inconspicuous property (3221) optioned from Radcliffe Resources Limited and located east of Conspicuous Cone on the northwestern coast of Graham Island. At the More property (323) on the Cumshewa Peninsula of Moresby Island, Cominco Ltd. drilled 34 percussion holes. Mondavi Resources Incorporated diamond drilled six holes in the Baxter Creek zone on its Snow property (324) located just south of Sandspit. At the Lockeport property (320) between Botany and Crescent Inlets, Skygold Resources Ltd. drilled 225 metres in nine holes under an agreement with the property owner, Foundation Resources Limited. The target is also epithermal precious metal mineralization, the most promising showing being a jasperoid zone in limestone adjacent to a fault. On the Eagle and Raven claims (319) just inside the north boundary of the federal park reserve at Klunkwoi Bay, Diamond Resources Incorporated completed three short drill holes testing showings of copper sulphides in amygdules, fractures and small shears in Karmutsen Formation basalt flows.

INDUSTRIAL MINERALS

Two significant industrial mineral properties on the mainland coast received further exploration in 1988 and show promise of early development. At the Lang Bay kaolin property (303) south of Powell River, the joint venture of Fargo Resources Limited and Brenda Mines Limited has completed an airborne geophysical survey and is presently engaged in the second major diamond-drilling program of 1988. Most recently reported geological reserves are 60 million tonnes of good quality kaolin consisting of both primary (residual) and secondary (sedimentary) kaolin. At the Mineral Hill wollastonite prospect (306) just north of Sechelt on the Sunshine Coast, owned by Tri-Sil Minerals Inc., the joint venture of Lone Jack Resources Ltd. and Canamin Resources Ltd. carried out additional trenching and 1087 metres of drilling in 16 holes.

Two limestone quarries continued in full operation on Texada Island during 1988 and notices were received to indicate the possible opening of a limestone quarry at Bamberton north of Victoria and a marble quarry at Bonanza Lake on the north end of Vancouver Island. Notice was received of plans to do some test drilling on a feldspar project at Sumas Mountain and to explore a jade occurrence in the Coquihalla River area.

COAL EXPLORATION

Only one significant coal exploration project has been reported on Vancouver Island in 1988. Canadian Occidental Petroleum Ltd. completed eight reverse-circulation drill holes on its coal licences at McIvor Lake west of Campbell River.

PLACER MINING

Placer mining is not a major activity in the Southwest District at the present time. Of the 13 notices of placer work received so far in 1988, five were for placer operations of small to moderate size on the Fraser River between Spuzzum and Hope. Four notices were for placer operations in the Leechtown area of southern Vancouver Island and only one of those, on Old Wolf Creek, could be considered a full-time, productive operation. Notices were also received for isolated operations on each of Bonanza River and Nanaimo River on Vancouver Island, Slesse Creek near Chilliwack, and Lillooet River north of Harrison Lake.

PRODUCING MINES

Table 2 provides details of the two major producing metal mines and one small coal producer in the Southwest District.

At the Myra Falls Operations (325) of Westmin Resources Limited near the south end of Buttle Lake, full production has continued through 1988 from the large H-W and the smaller Lynx underground mines. Starting in late 1987, the capacity of the mill was expanded by 33 per cent and it is now operating at or near its new rated capacity of 4000 tonnes per day. Total published reserves in all categories at the start of 1988 were 12.5 million tonnes averaging 2.40 per cent copper, 0.36 per cent lead, 5.28 per cent zinc, 2.4 grams per tonne gold and 37.7 grams per tonne silver. Underground exploration drilling is ongoing at both operating mines in order to maintain and confirm future reserves. The orebodies being mined are polymetallic massive sulphide deposits occurring in rhyolitic horizons within a mixed package of Paleozoic Sicker Group volcanic rocks.

The Island Copper mine (326) of BHP-Utah Mines Limited on Rupert Inlet near Port Hardy also continued in full production in 1988 at a milling rate of approximately 45 000 tonnes per day. Only about 30 million tonnes of the original 257-million-tonne orebody remain accessible to mining within the present open pit. However, a substantial tonnage of additional ore-grade mineralization was identified by drilling in the southeast corner of the pit in 1985. It is beyond the design limits of the present pit but, if developed, would add about four years to the remaining life of the mine. A procedure for recovering these additional reserves has been designed, government guidelines and approvals are in place, but so far the company has not decided whether to proceed with the proposed pit expansion. The Island Copper orebody is a porphyry copper-molybdenum-gold deposit associated with a Jurassic quartz feldspar porphyry dyke intruding Bonanza Group andesitic tuffs.

Quinsam Coal Limited has been producing thermal coal from its coal deposit at Middle Quinsam Lake (3276) at a steady rate of 15 000 tonnes per month through 1988 and selling it to the British Columbia cement industry. The company is still waiting for improved thermal coal markets before proceeding to full production at the originally designed rate of about 1 million tonnes annually.

DEVELOPMENT

There are no new mines currently being developed in the Southwest District. The project which is closest to reaching that status is the Cinola gold property (321) on Graham Island. The operator, City Resources (Canada) Limited, has completed a favourable preliminary feasibility study and has submitted a Stage II report to the Mine Development Review Process. If the project receives timely approval-in-principle and a production decision is made by the operator, production could begin in 1990.

As stated above, the Quinsam coal mine near Campbell River is presently operating on a small scale and development to the full design capacity will depend on improved markets for thermal coal. Other projects that are currently preparing Stage I submissions for approval and which appear to be on track for development in the near future are the Lara polymetallic prospect (274) west of Chemainus and the Spud gold project (287) at Zeballos.

FAME - FINANCIAL ASSISTANCE FOR MINERAL EXPLORATION PROSPECTORS ASSISTANCE PROGRAM

James Pardy, Prospectors Assistance and Training Officer
200 -756 Fort Street, Victoria, B.C. V8W 3A3
Telephone: (604) 356-8182

INTRODUCTION

The 1988 Prospectors Assistance Program is a FAME-funded, $500 000, one-year program to promote prospecting activity in the province. It is designed to provide part of the risk capital required by prospectors in the search for mineral deposits. Sound, well-conceived prospecting programs are supported with financial assistance. Prospecting targets eligible for assistance include lode and placer deposits of metallic and industrial minerals (except sand and gravel), and coal deposits.

THE PROGRAM

The program was approved by Cabinet on March 24, 1988 and information brochures and application forms were released to the public through ministry offices and government agents immediately following. Applications received by May 1 were considered for initial allotment of funds - grants were allocated in the last week of May.

Applications received	205
Grants awarded	137
Maximum grant	5000
Average grant	3109

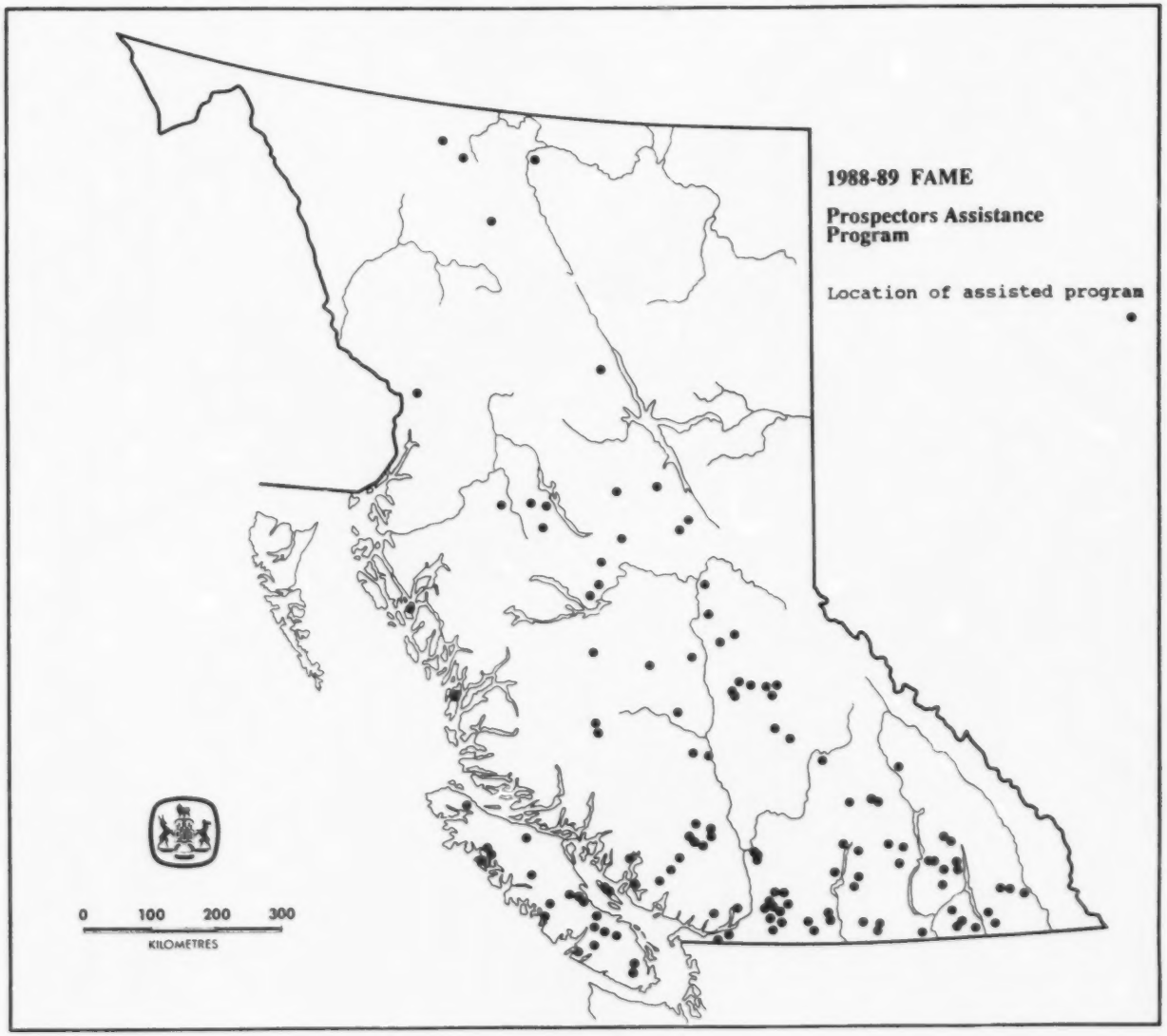
The 205 applications received are down 26 per cent and the 137 grants awarded are down 15 per cent from 1987-88 levels, whereas, the average grant of $3109 is up 21 per cent from the average of $2573 in 1987-88.

Maximum assistance is $5000 per prospector for a pre-approved prospecting program. Fifty per cent of the grant awarded is payable on approval, with the remainder on receipt of a satisfactory prospecting report. Applications for assistance are evaluated on the basis of points awarded for each of the following selection criteria:

Quality and documentation of proposal	45 per cent
Experience and training of applicant	20 per cent
References and recommendations	20 per cent
Financial commitment of applicant	15 per cent

Prospectors are required to submit a summary prospecting report documenting activities and expenditures. Reports must include maps, i.e. location maps, geological sketch maps and sample location maps, and supporting data such as geochemical analyses and, assay certificates and geophysical data. Final payment of the grant is made upon approval of the summary prospecting report.

The Prospectors Assistance Program is staffed by a Prospectors Assistance and Training Officer whose duties include assessing grant applications, visiting prospectors in the field to provide technical assistance and to monitor progress, and reviewing summary prospecting reports. Thirty-three per cent of the 137 grant recipients were visited this past prospecting season. Most of the assisted programs are concentrated in the southern half of the province in areas of active exploration and good access (see map).


1988-89 FAME
Prospectors Assistance Program
Location of assisted program
0 100 200 300
KILOMETRES

The per centage of assisted programs by primary target commodity is as follows:

Base metals	1.5 per cent
Industrial minerals	4.5 per cent
Placer gold	17.5 per cent
Base and precious metals	29.0 per cent
Lode gold and silver	47.5 per cent
	100.0 per cent

Changes in primary target commodity from the 1987-88 program include an increase in placer gold programs from 10 per cent to 17.5 per cent and a decrease in hardrock precious metal programs from 57 per cent to 47.5 per cent.

Results to Date

Fifty one summary prospecting reports, representing 37 per cent of the total number of grants, had been received by January 5, 1989. Fourteen of these prospectors report that further work is warranted on showings discovered or worked on this season. A total of seven option agreements have been made on these properties; work commitments amount to approximately $750 000. Figures for programs completed to date are:

Total prospecting expenditures	$437 859
Average expenditure/prospector (including grant)	$ 8 585
Total grant funds approved	$425 900
Average grant	$ 3 119
Total prospecting days in the field	2225
Average number prospecting days/ prospector	43.6
Claim units staked	974
Total work commitments through option agreements	$750 000

Future Programs

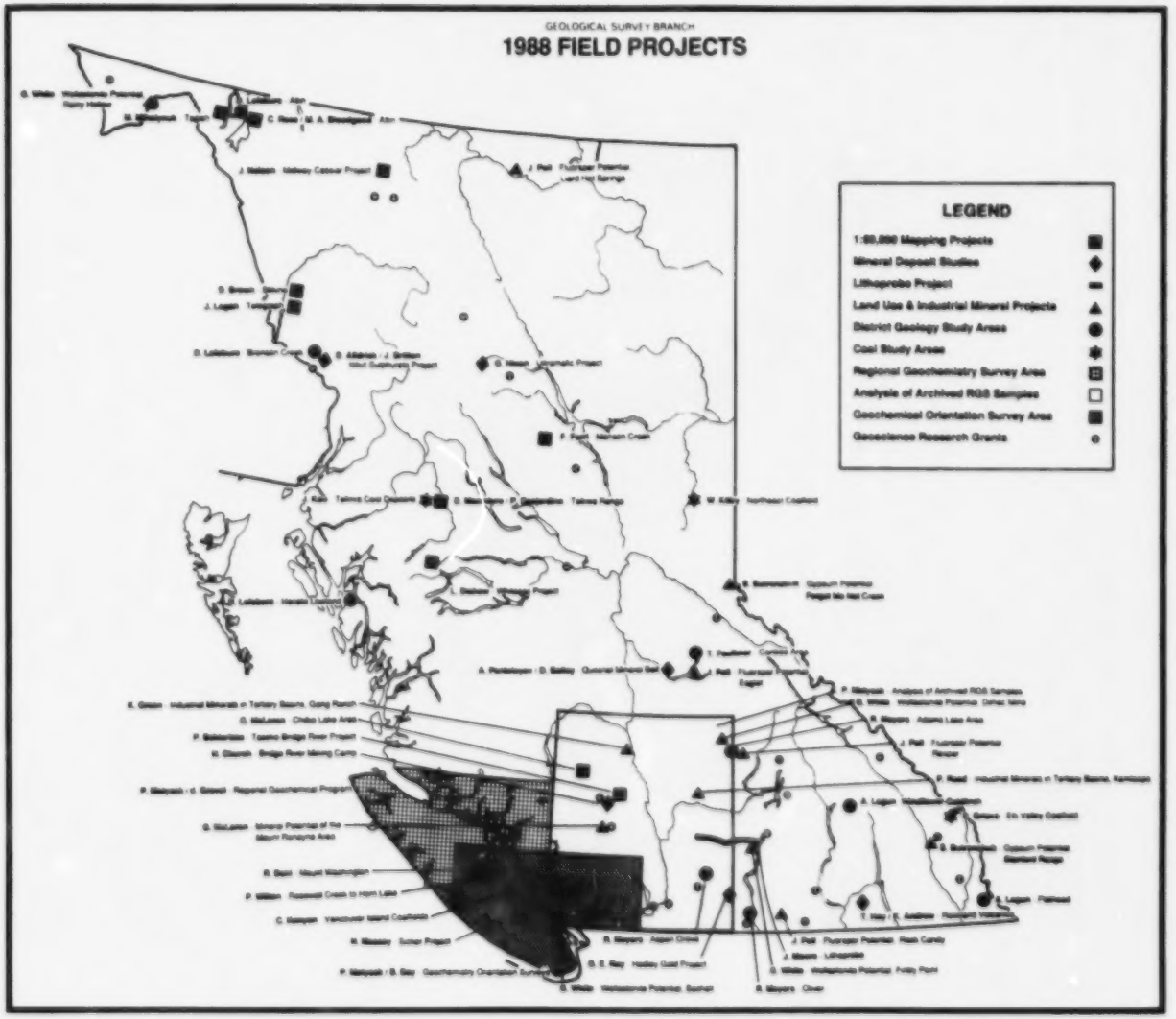
A number of changes will be incorporated to improve future programs; most noteable are:

* The maximum grant is increased to $7500 from the previous $5000 to encourage more substantial prospecting programs and grass roots prospecting in remote areas of the province and recognize the added financial commitment incurred in carrying out these programs.

* Abolish the current indefinite confidentiality of summary prospecting reports and establish a 5-year confidentiality period prior to releasing the reports to the public domain.

* Increase from 20 to 30 the minimum number of actual prospecting days in the field required to qualify for final payment of the grant.

* Establish a minimum expenditure of $250 for analytical/assay work per grant (excluding placer programs).


GEOLOGICAL SURVEY BRANCH
1988 FIELD PROJECTS
LEGEND
1:50,000 Mapping Projects
Mineral Deposit Studies
Lithoprobe Project
Land Use & Industrial Mineral Projects
District Geology Study Areas
Coal Study Areas
Regional Geochemistry Survey Area
Analysis of Archived RGS Samples
Geochemical Orientation Survey Area
Geoscience Research Grants

1988 FIELD ACTIVITIES
GEOLOGICAL SURVEY BRANCH

The 1988 Branch field program was the largest in our history. Most of the increase was in the area of regional mapping, but a high level of activity was maintained in mineral deposits, land use coal studies, and industrial mineral programs. New mapping projects were initiated in the Atlin, Stikine and Telegraph map-areas, work was extended in the Chilko Lake area, new coal mapping and evaluation studies were started, and phosphate and fluorite studies begun. The geoscience database was also further enhanced during the year with improvements to MINFILE, Coalfile, the assessment report files and the property files.

MINERAL DEPOSIT STUDIES

In the Mineral Deposits Subsection, district studies of precious metal camps continued to be the main thrust, but projects were given a broad mandate - to identify and assess all mineralized environments within the study areas.

Neil Church completed the field component of mineral deposit, fracture analysis and metal zoning studies in the historic Bridge River Camp. Andre Panteleyev finished his contribution to the DNAG volume and spent a shortened field season completing the field component of a study of the geology and gold and copper-gold mineral deposits in the Quesnel area. Mapping was extended northward by consultant Dave Bailey and Andre's work filled remaining gaps in the coverage. Apparently the base of the Mesozoic volcanic section interfingers with underlying sediments and there are no major tectonic breaks.

Dani Alldrick headed our largest field crew, mapping favourable stratigraphy westward from the complex Sulphurets gold camp. A synthetic aperture radar (SAR) survey of the area was flown by Energy, Mines and Resources Canada as part of a joint research project that will test the methodology in this rugged terrain.

Trygve Höy, expanding work begun last year in the Rossland-Ymir districts, recognized that the formerly producing Second Relief deposit is a stratabound gold skarn, not a vein deposit, and this observation sparked considerable interest.

Gerry Ray is carrying out office studies leading to publication of bulletins summarizing mineralization in the Coquihalla belt and work done in the Hedley gold-skarn camp. Together with Art Ettlinger, he has also compiled information on precious-metal-enriched skarn deposits in British Columbia; this major paper is currently in preparation.

Metallogenic studies of mafic and ultramafic rocks continued in a largely MDA-funded project led by Graham Nixon. Alaskan-type complexes were mapped and sampled in the Turnagain, Gnat Lakes, Mount Hickman, Menard Creek and Polaris complexes to assess platinum group element and other mineral potential. Most of the work was on the 80-square-kilometre Polaris complex; chromatite and sulphide occurrences were sampled and detailed geochemistry is planned.

Tom Schroeter continued his investigations of major gold deposits in British Columbia.

REGIONAL MAPPING

The Regional Mapping Subsection produces 1:50 000 geological maps but also is responsible for evaluating mineral potential. The program has both MDA and A-Base funding and was expanded from four to seven projects in 1987. In 1988 the program was further enhanced by the province and three more mapping projects were started - two in the Stikine River area (Jim Logan and Derek Brown) and one in the Atlin district (Mary Anne Bloodgood).

Fieldwork for Nick Massey's Sicker Project, started in 1986, is now complete. His work has helped refine the stratigraphy of the Paleozoic Sicker Group, an important host for polymetallic massive sulphide deposits of the Westmin type. New target areas have been delineated as a result of the mapping; a pillow lava sequence underlying Nitinat Formation is regionally extensive and contains a chert/felsic tuff unit that hosts the 900 zone of the Debbie property.

JoAnne Nelson has been mapping in the Midway-Cassiar area since 1986. She has shown that the Sylvester allochthon, which contains a possible dismembered ophiolite sequence, formed in a marginal basin setting not far removed from ancestral North America. High-angle post-compression fault sets in the area control the distribution of epigenetic vein-gold deposits such as Total Erickson's Vollaug and Jenny veins. New data show that rocks in the hanging wall of the Vollaug vein are Triassic, not Paleozoic.

A new mapping project, with Mary Anne Bloodgood as project leader, was started in the Atlin placer gold camp. In this area the placer deposits are spatially associated with fault zones that cut ultramafic and altered volcanic rock of the Cache Creek terrane. Recently, lode gold deposits have been discovered in major fault zones and are the focus of considerable exploration activity.

Mitch Mihalynuk continued mapping and geochemical sampling in the Tutshi-Tagish lakes area, where a number of fault-controlled gold occurrences are being actively explored as a result of last years program. Mitch and his crew have refined the regional stratigraphy and structure with recognition of a profound unconformity separating the Paleozoic Nisling terrane from younger Mesozoic strata.

Two other new mapping projects were begun north of the Iskut River. Jim Logan and Derek Brown, project leaders for the Telegraph and Stikine projects respectively, focused their work on resolving the stratigraphic and structural setting of the Paleozoic Stikine assemblage and overlying Triassic volcanic rocks. The map area covers part of a belt of syenitic intrusions that lies east of the Coast plutonic complex; the area has been the site of active gold exploration and hosts the Galore Creek porphyry copper-gold deposit.

Don MacIntyre and Pat Desjardins completed mapping in the Babine Range and moved westward across the Telkwa River valley into the Telkwa Range. This work has resulted in a better understanding of the Lower to Middle Jurassic stratigraphy of the Telkwa, Nilkitkwa and Smithers formations. The bimodal volcanics of the Nilkitkwa Formation are favourable hosts for gold and silver-bearing quartz veins. Don and Paulette Tercier have recompiled mapping by Rod Kirkham on Hudson Bay Mountain; the data will be released this spring.

In the Whitesail Lake area, mapping by Larry Diakow has resulted in a better understanding of Jurassic, Cretaceous and Tertiary stratigraphic relationships. Of particular significance is the delineation of favourable metallotects for precious metal vein deposits.

In the Manson Creek - Germansen Lake area, Filippo Ferri completed a second year of mapping focusing on the Takla - Slide Mountain - Ingenika - Wolverine complex terrane boundaries. This project has resulted in further subdivision of the Slide Mountain Group and division of the Takla Group into five mapable units. The map area is an old placer gold camp with possible lode gold potential. Listwanitic alteration occurs along the Manson Creek fault zone.

Farther south, in the Tasekо Lakes area, Keith Glover and new project leader Paul Schiarizza have refined the tectonic and stratigraphic relationships between the Bridge River terrane and younger Mesozoic rocks. This work has resulted in a clearer understanding of the tectonic history of the area - an important piece in the British Columbia tectonic puzzle. The work has shown that overturned folds and thrust faults in mid-Cretaceous rocks predate transcurrent faulting. Permo-Triassic blueschists in the Bridge River complex, dated at 244±17 Ma (K/Ar) and 217±5 Ma (Rb/Sr), are seen as boulders in Cretaceous conglomerates. Sheeted dykes discovered cutting Bridge River complex add credence to the interpretation of the Shulaps complex as a structurally inverted, dismembered ophiolite sequence.

Keith Glover resigned in May to pursue a consulting career; we extend thanks for his excellent contributions and wish him success in future endeavours.

APPLIED GEOCHEMISTRY

Data released through the Applied Geochemistry Subsection in July, 1988, from samples collected in 1987 in northwestern British Columbia from the Iskut River, Sumdum, Telegraph Creek and Tulsequah map sheets sparked considerable exploration interest and activity. Ninety copies of the dataset were sold on release day; to date sales total 120 sets and 30 floppy diskettes.

In 1988, crews sampled 2746 sites on northern Vancouver Island; 1657 were moss-mat sediment and water samples, the rest are standard stream sediments and waters. Moss was selected as the best medium on the basis of 1987 orientation surveys. Bismuth has been added to the list of elements to be analysed in these samples because it is a pathfinder for deposits on northern Vancouver Island. We plan to hold the 1989 data release in June.

In 1988, orientation surveys were conducted on southern Vancouver Island and the adjacent mainland, and in the Bowser Basin of north-central British Columbia. The subsection also continued research into improved use of analytical results and the effects of seasonal changes on geochemical responses.

INDUSTRIAL MINERALS

The Industrial Minerals Subsection continued to expand knowledge of understudied industrial mineral commodities in the province in 1988. Field activities this year were concerned with wollastonite, phosphate, fluorite, and the industrial mineral potential of Tertiary basins in the province.

Gary White mapped and sampled seven properties previously reported to contain occurrences of wollastonite. These are the Little Billy mine on Texada Island, Sechelt Penninsula, Silence Lake near Clearwater, Fintry Point west of Kelowna, Horsethief Creek near Windermere, Maid of Erin on Haines Road, and a property on the Skeena River. It is confirmed that the first five are of potentially economic size; CANMET is currently carrying out quality assessment and processing studies of samples.

Steve Butrenchuk spent most of the field season mapping Devonian gypsum-bearing formations in the southeastern corner of the province. Most of the work was between Cranbrook and Windermere in and south of the Stanford Range. He also examined occurrences in Triassic rocks near Forgetmenot Creek north of McBride.

Known fluorite occurrences and fluorine-in-water anomalies from the Regional Geochemical Survey were studied by Jennifer Pell. She mapped the major occurrences - Rock Candy, Eaglet, Rexspar and the area around Liard Hot Springs, and also a newly discovered alkaline complex in the Kechika River area. The alkaline complex apparently has local enrichment in yttrium and rare-earth elements.

Both Peter Read and Kim Green mapped and evaluated mineral potential in Intermontane Tertiary basins this summer. Peter concentrated on exposures in the Bonaparte and Deadman River areas; Kim worked near Gang Ranch. Virginia Marcille has begun a thesis at the University of Calgary to evaluate the agricultural potential of zeolites discovered near Princeton in 1986.

The subsection completed and published compilations of talc and pyrophyllite resources, magnetite potential, and garnet-kyanite potential. Compilations of peat and sulphur resources are nearing completion. Native sulphur was known from Devonian evaporites but is also relatively widespread in Triassic evaporites.

Processing studies by CANMET on feldspar samples collected by Gary White in 1987 show that concentrates from several occurrences can meet industry standards. These are Trident Mountain, the Bearcub claims near Lumby, the Hellroaring Creek prospect near Kimberley, and the sands from Scuzzy Creek.

COAL

Fieldwork concentrated on Vancouver Island. Candace Kenyon, with the assistance of contractor Corilane Bickford, continued mapping and sampling in the Comox sub-basin. At the Quinsam mine a very promising program to test the feasibility of coal sample collecting with small diameter drills was carried out by Alex Matheson. This capability will allow the Branch to collect unaltered samples in frontier areas. In the Peace River coalfield, Ward Kilby identified significant coal rank increases due to frictional heating along a major fault.

Under the coal-quality program a coal-quality catalogue and brochure were prepared for release in 1989. Coal-analysis programs began with the initial emphasis being on sulphur studies, trace element analysis, ash mineralogy and petrography.

Major publication preparation efforts by the group include Geology and Resources of the Elk Valley Coalfield by David Grieve, and Vitrinite Reflectance Studies in the Peace River Coalfield, Tonsteins and Bentonites in Peace River Coalfield both by Ward Kilby.

Digital deposit models for the Quinsam and Mount Klappan deposits were under construction by members of the subsection during the year.

MINERAL LAND USE

1988 was an active year in land-use developments in British Columbia, and staff were very busy both in the field and office. The Land Use subsection carried out two field projects in 1988; in the Taseko Lakes and Pemberton areas. Geological mapping and stream sediment sampling at Taseko Lakes filled a gap in the 1:50 000 data previously gathered by Graham McLaren to the west near Chilko Lake and by Keith Glover and Paul Schiarizza to the east in the Taseko River to Gold Bridge area. Porphyry copper-molybdenum and precious metal vein deposits are known in the area. Significant gold values were detected in talus samples of arsenopyrite veins derived from a steep cliff face where a diorite intrusive cuts volcanic rocks.

The Tenquille Lake to Owl Mountain area north of Pemberton has a long history of mining activities but is also a popular alpine hiking area and has been considered for recreation area status. Upper Triassic (Cadwallader Group?) rocks and intrusives of the Coast Complex host numerous skarn, vein and porphyry occurrences throughout the area. Mapping in this project outlined an extensive acid volcanic horizon that contains a previously undocumented occurrence of stratabound massive sulphide

mineralization, and cherty exhalative rocks. Further evaluation is required to assess the volcanogenic massive sulphide potential of the area and the relationship of the vein and calc-silicate mineralization to this type of mineralization.

In September the decision of government to endorse the recommendations of the Strathcona Park Advisory Committee had a major affect on mineral land use in the province. This decision put an end to further mineral exploration in Strathcona Park. Government intends to arrange fair compensation for existing mineral claims affected by this policy. A further announcement was made in December that there will be no further exploration in Wells Gray, Tweedsmuir, Manning or Kokanee Glacier parks. With the Mineral Tenure Act in place as of August 1988 an inter-ministry agreement governing exploration in recreation areas can be implemented. To this end, the December announcement identified almost 1 million hectares in recreation areas that would be opened to time-limited exploration as of February 15, 1989, while some 225 000 hectares would be closed to any further exploration. Final decisions on the Skagit-Cascades Recreation Areas and the Purcell Wilderness Conservancy are awaiting the outcome of public master planning programs.

Other issues potentially affecting mineral exploration that demand involvement of the Land Use Subsection include a plan to register the Lower Stikine and Dease Rivers as recreation corridors, the creation of forest wilderness areas under the Forest Act, the creation of wildlife management areas under the Wildlife Act, and a variety of other more local site-specific studies.

MINFILE

MINFILE is the Branch's computerized mineral inventory database. The present researching and recording of data on mineral occurrences in the province is jointly funded by the Canada/British Columbia Mineral Development Agreement (1985-1990) and the Provincial government. Fifty per cent of the mineral occurrences in the province have now been recoded with fourteen per cent of data for the province now released, this includes data for ten 1:250 000-scale map sheets.

Computer upgrades and redesign during 1988 included the use of ESL Map, a computer graphics program, to generate location maps and near year-end work was started on programming a hard copy reporting facility for the MINFILE/pc search program.

PROPERTY FILE/REGIONAL FILE

Property File is the hard copy backup to MINFILE. It contains the original data keyed into MINFILE, miscellaneous published and unpublished reports, maps, press clippings, air photos, etc. Regional File contains similar data with its filing structure based on the NTS rather than on specific MINFILE numbers. Upgrading and maintenance of both systems is jointly funded by the Canada-British Columbia Mineral Development Agreement (1985-1990).

Progress throughout the year on Property File included completion of the reorganization from an NTS-based structure to one based on the MINFILE numbering system combined with a two-digit subject code. Every map, airphoto, report and prospectus that existed in the NTS-based structure has been appropriately labeled and filed. A substantial amount of material donated from various sources was incorporated into Property File. Work began near year-end on the filing structure for the Regional File with planned transfer and integration of the material to occur in 1989-1990. Contributions of historical data and technical information on mineral occurrences which may be added to Property File are encouraged. Property File is open to public viewing during normal business hours in Victoria.

ARIS

ARIS is the Branch's new computerized assessment report indexing system which began development in late 1987. It performs various administrative tasks for the section such as issuing letters, providing assistance in tracking progress on various asessment reports submitted by industry, and producing summary reports on assessment report filings.

The Data Entry facility was completed in April and an on-line Inquiries System was operational by July. The on-line inquiries available for in-house users include queries by claim name, owner/operator/author name, property name, Mining Division, NTS mapsheet, MINFILE number, and latitude/longitude. Many reports for in-house use were generated, in addition to reports distributed to external users which included "Exploration in British Columbia, 1987" (Part C, Alphabetical Index, Map), approval, and rejection letters.

PLANS FOR 1989

The Branch program planned for the 1989 season is similar in size to this year's. Fieldwork for the Sicker project is complete and the final report will be prepared; most mapping projects will continue but it will be the last year of fieldwork in the Cassiar, Babine Range and Whitesail areas.

Mapping in the Tagish Lakes area will continue to work southeastward, the Atlin project moves southward, the Stikine and Telegraph projects south and north respectively, and the Manson project continues to the north. On the mineral deposits side, the Quesnel and Bridge River projects enter the writeup phase, and fieldwork for the Sulphurets and ultramafics projects will be completed. The Rossland project continues, and a modest program will continue work in the Nicola belt. Two new projects are planned. One will study gold-related listwanite alteration, the other will expand our survey of gold-related skarn deposits to include base metal skarns.

The Regional Geochemical Survey will complete sampling of Vancouver Island and the adjacent mainland. Results from this year's sampling are planned for release in early June. Orientation surveys and related research will continue at the present level. Areas to be covered next are under active discussion.

In Industrial Minerals section, plans include a study of specialty, high volatile granites that have potential for tin, tungsten, berylium, yttrium and rare earths. They will also prepare an open file report on chromite, an assessment of barite, limestone and dolomite resources, and a field reconnaissance of perlite, vermiculite and natural pozzolan showings in the province. A final report will be prepared on the Tertiary Basins project.

The coal group is also planning a busy year. Mapping will be completed in the Tumbler Ridge and Comox areas. A subsurface sampling program will continue, principally in the Nanaimo Coal Basin. A detailed coal quality study of the Telkwa deposit will be completed and the Upper Cretaceous coal potential of northeastern B.C. will constitute a new frontier project.

The MINFILE project will continue with an emphasis on completing coding of mineral occurrences, particularly in southern B.C. The project team expects to release data for 15 new map sheets during the year. Enhancements to the computer database will include improved reporting capabilities, the addition of a work history information to the database and implementation of data entry on personal computers (currently all data is input to the VAX mainframe computer). Field projects for the Land Use Subsection have not been resolved for 1989. However, the Purcell Wilderness conservancy and Skagit-Cascades Recreations areas have been identified as requiring mineral potential studies.

Overall the Geological Survey Branch will endeavor to improve the geoscience database and dissemination of this information to the mining industry, government organizations and interested members of the public.